£3.25
DM.18

October 1991

Commodore DISK·USER

STAR PLOTTER

Printer Utilities in Space!!!

ON THE DISK

- FLIGHT SIM II – PATCH
- DISK ECONOMISER
- GEO GRAB
- FILE UTILITIES
- 6510+ HEADER CREATOR
- PRINTER GRAPHIC DESIGNER
- GEOPOUND
- COMPUTER AIDED STUDY

ISSN 0953-0614
10
9 770953 061014

Elvira®

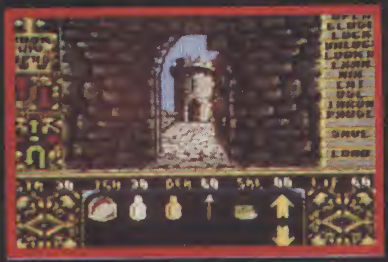
mistress of the dark™

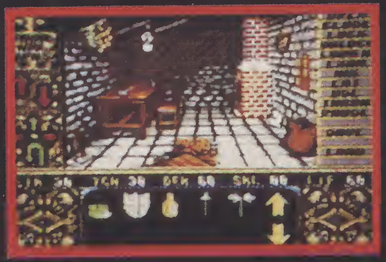
- Hour upon hour of addictive entertainment
- Totally icon-driven for ease of play
- Turbo disk loading guarantees fast graphical access
- An Award Winning game

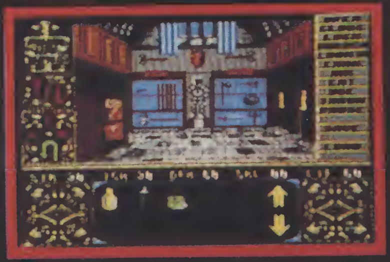
A SUPERB FANTASY ROLE-PLAYING GAME WITH OUTSTANDING GRAPHICS AND GAMEPLAY

- Over 1 Megabyte of game code supplied on 3 double-sided disks

- Hundreds of locations in and around Elviras Haunted Castle
- Hand to hand real time combat with Knights and Monsters
- Includes instructions and secret spell book for mixing spells and potions

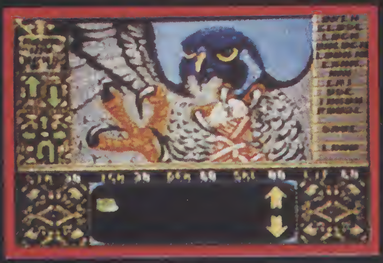

CASTLE RAMPARTS
CBM64

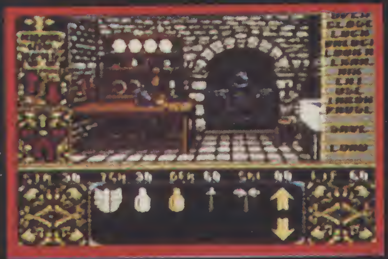

GARDENERS SHED
CBM64

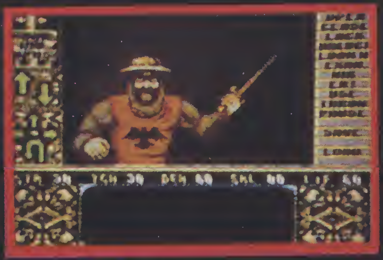

CASTLE ARMOURY
CBM64

AWESOME QUALITY: THE BEST FRP EVER SEEN ON THE CBM 64

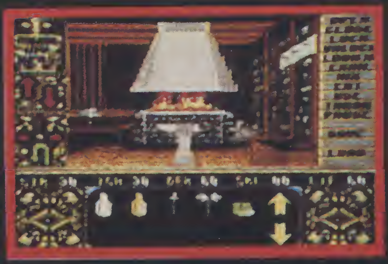
ELVIRA rescues you from the Jailers cell and sends you on an unforgettable mission to dispose of the spirit of her great great grandmother **EMELDA.** On your travels in and around the **HAUNTED CASTLE** you will come across some of the most weird and… ….EVIL monsters and beings you have ever encountered. From **UNDEAD KNIGHTS** to the **CATACOMB BEAST, WEREWOLVES** to a **VAMPIRE,** and of course wicked **EMELDA** herself, this is the challenge that you will play **AGAIN AND AGAIN!**


FALCON ATTACK
CBM64


ELVIRA IN THE KITCHEN
CBM64


A KNIGHT FIGHTING

ALL SCREENSHOTS FROM CBM64


THE BLACKSMITHS FORGE
CBM64

For information about the Elvira Fan Club:
14755 Ventura Blvd.,
#1-710, Sherman Oaks, CA 91403, USA

DESIGNED BY HORROR SOFT LTD

FLAIR SOFTWARE

**Available from your local dealer or direct from Flair Software Ltd, The Smithy Side,
7 Belle Villas, Ponteland, Newcastle Upon Tyne. NE20 9BD Priced £24.99**

Commodore ·DISK·USER·

Volume 4 Number 12 OCTOBER 1991

ON THE DISK

IN THE MAGAZINE

Group Editor: Rik Henderson
Designer: Helen Saunders
Technical Editor: } John Simpson
Program Evaluator: }
Sales & Marketing Director: Paul Crowder
Advertisement Manager: Cass Gilroy
Display Sales: Deborah Curran
Publisher: Hasnain Walji
Distribution: Seymour Press Distribution Ltd.
Winsor House, 1270 London Road,
Norbury, London SW16 4DH.
Tel:081 679 1899. Fax: 081 679 8907

Subscription Rates

UK	£39.00
Europe	£45.00
Middle East	£45.00
Far East	£50.20
Rest of World	£46.50

Airmail rates on request
Contact: Select Subscriptions. Tel: (0442) 876661

Printed By: Gibbons Barford Print

Commodore Disk User is a monthly magazine published on the 3rd Friday of every month. Alphavite Publications Limited, 20, Potters Lane, Kiln Farm, Milton Keynes, MK11 3HF. Telephone: (0908) 569819 FAX: (0908) 260229. For advertising ring (0908) 569819

Opinions expressed in reviews are the opinions of the reviewers and not necessarily those of the magazine. While every effort is made to thoroughly check programs published we cannot be held responsible for any errors that do occur.

EDITORS COMMENT

And so ends an era, the mighty Paul Eves has finally decided that - although it pained him to do so - it's time for him to seek pastures new. But, you're wondering, what does this mean for CDU and yourself?

Firstly, it means that I shall be taking hold of the editorship of this title, and although one CDU reader wrote a while back saying that "if Rik ever gets hold of CDU, it'll be a disaster", it's a) not a disaster, and b) we can offer you a better title from now on. Secondly, I think I'd better list my credentials - you wouldn't want a complete stranger exercising a dictator-like grip on the magazine now, would you?

Having previously worked on Computer Gamesweek, Amstrad Computer User, and Amstrad PC, I took over Your Commodore when it still contained serious content. Since which time I've edited YC and Your Amiga, and now I'm here.

I think I'll end with a "good luck" message to Paul, and I'm sure I speak for the magazine and it's following when I say, "a jolly good job you've done!" Catch you soon!

Rik Henderson

DISK INSTRUCTIONS

Although we do everything possible to ensure that CDU is compatible with all C64 and C128 computers, one point we must make clear is this. The use of 'Fast Loaders', 'Cartridges' or alternative operating systems such as 'Dolphin DOS', may not guarantee that your disk will function properly. If you experience problems and you have one of the above, then we suggest you disable them and use the computer under normal, standard conditions. Getting the programs up and running should not present you with any difficulties, simply put your disk in the drive and enter the command.

```
LOAD"MENU",8,1
```

Once the disk menu has loaded you will be able to start any of the programs simply by selecting the desired one from the list. It is possible for some programs to alter the computers memory so that you will not be able to LOAD programs from the menu correctly until you reset the machine. We therefore suggest that you turn your computer off and then on again, before loading each program.

HOW TO COPY CDU FILES

You are welcome to make as many of your own copies of CDU programs as you want, as long as you do not pass them on to other people, or worse, sell them for profit. For people who want to make legitimate copies, we have provided a very simple machine code file copier. To use it, simply select the item FILE COPIER from the main menu. Instructions are presented on screen.

DISK FAILURE

If for any reason the disk with your copy of CDU will not work on your system then please carefully re-read the operating instructions in the magazine. If you still experience problems then:

1. If you are a subscriber, return it to:
Select Subscriptions Ltd
5, River Park Estate
Berkhamsted
Herts
HP4 1HL Telephone; 0442 876661

2. If you bought it from a newsagents, then return it to:

CDU Replacements
COPYTEC SOFTWARE SOLUTIONS
Unit 29
Riverside Business Centre
Victoria Street
High Wycombe
Bucks
HP11 2LT

Within eight weeks of publication date disks are replaced free.

After eight weeks a replacement disk can be supplied from COPYTEC SOFTWARE SOLUTIONS for a service charge of £1.00. Return the faulty disk with a cheque or postal order made out to COPYTEC SOFTWARE SOLUTIONS and clearly state the issue of CDU that you require. No documentation will be supplied.

Please use appropriate packaging, cardboard stiffener at least, when returning disk. Do not send back your magazine, only the disk please.

NOTE: Do not send your disks back to the above address if its a program that does not appear to work. Only if the DISK is faulty. Program faults should be sent to: BUG FINDERS, CDU, Alphavite Publications Ltd, Unit 20, Potters Lane, Kiln Farm, Milton Keynes, MK11 3HF. Thank you.

FLIGHT SIM II - PATCH

Got a C128? Got a copy of FLIGHT SIM II? Let GLENN DAVIES show you how to run this classic on your C128

FLIGHT SIMULATOR II is a classic program and certainly the most authentic flight simulator for the Commodore 64/128. It was, however, written almost 8 years ago, before the Commodore 128 was available. Newer games such as STEALTH MISSION and PROJECT - STEALTH FIGHTER take advantage of the Commodore 128's extra speed capability. FLIGHT SIMULATOR II does not - until now.

This program enhances the frame rate (that is, the rate at which the 3D display is refreshed) of FS2. The aircraft becomes more easy to control in areas of dense scenery, and on approach and landing. The frame rate is enhanced by roughly 20-25%, which may not sound like much, but it is enough to make a difference. By the way, the program still runs in real time with this modification in place. If it took 10 minutes to fly a certain distance on the original version - it still takes 10 minutes to get there now.

REQUIREMENTS

To use the program, you need a C128 (obviously), a disk copy of FLIGHT SIMULATOR II (this may work on the relatively rare tape version - but I haven't tried it), and a freeze cartridge which allows you to alter the program with a machine code monitor.

☛ If you own an Action Replay cartridge with the multiload parameter facility then read **PART A**. If you don't know whether your cartridge has this facility, check the manual or freeze any program and check for P - PARAMETERS on the menu that appears.

☛ If you own any other cartridge which has a machine code monitor then read **PART** B. Owners of Action Replay cartridges without the parameter facility should also read this section.

☛ All users should read **PART C**, as this describes how to use the program.

PART A

Load the file "FS2-PARAMETER" from the CDU disk. Have a disk ready. Run the program and follow the on screen prompts. This program saves a file "P900" to disk. Reset the computer with NORMAL RESET and load FS2. Once you are on the runway at MEIGS FIELD, press the freeze button. Insert the disk with "P900" on it. Press "P" and enter P900 as the parameter name. The parameter will load and you can restart FS2.

PART B

Load the file "FS2-FILES" from the CDU disk. Have a disk ready. Run the program and follow the on screen prompts. This program saves eight files to disk, named "1" to "8". Reset the computer and load FS2. Once you are on the runway at MEIGS FIELD, press the freeze button on your cartridge. Using the machine code monitor on your cartridge, load each of the eight files in turn, making sure you load all eight. Check you cartridge manual for how to load blocks of data. You may now restart FS2.

*** ATTENTION ACTION REPLAY OWNERS !**

You will be unable to load files "1" and "3" using the above method, although all other files will load correctly. Load the other files as described above then type the following:

L "1",8,D000 (return) to load file "1"
T D000 D088 0150 (return) to put the data in the correct place

L "3",8,D000 (return) to load file "3"
T D000 D02A 03A0 (return) to put the data in the correct place

You may now restart FS2.

PART C

You will notice that the instrument panel border colour now extends to the top of the 3D viewing area. Press RESTORE to switch between "normal" and "fast" modes. The position of the split between border colours at the top of the 3D viewing area indicates the mode you are in. In "fast" mode the split is further to the left. "Fast" mode is disabled after any scenery load or use of the editor. To re-enable "fast" mode, press RESTORE.

If you wish, you can change the modification so that you do not have to re-enable it by pressing RESTORE after a scenery load. After you have loaded all the files, or the parameter, enter the machine code monitor on your cartridge. Load the files "FS2-PATCH1" and "FS2-PATCH2" from the disk in the manner described earlier. Note that these are not Action Replay parameters, and should be loaded with the load command of your monitor. FS2 will now automatically re-enable "fast" mode after a scenery load, or editor usage.

STARPLO

Use a STAR LC-10 or compatible printer to simulate a high-resolution plotter! - D.H.FABER

This article describes a series of programs that enable the use of simple BASIC commands to simulate a plotter with a resolution of better than 200 dpi. on a STAR LC-10. Other printers with a graphic mode of 240*216 dpi. can also be used, including 24-pin printers if they have a 8 pin graphic mode. Both serial and centronics/user port interfaces can be used. Also, for assembler programmers it is described how to use this 'PLOTTER' from their programs.

A QUICK INTRO

Nowadays, following the widespread penetration of PC's, centronics printers have become rather cheap. Since these printers can be easily connected to a C64 (some types are even available with a built-in Commodore-type serial interface) many new C64 users have purchased such a printer and "old hands" may have replaced their old worn-out Commodore working horse by such a type. This program uses the abilities of these printers to mimic a plotter with "next-to-perfect" precision.

When designing a program like this one, one is immediately confronted with a prime choice: given a printer that can transport the paper in reverse direction it would, in principle, be possible to write a BASIC extension that executes plot commands 'on-line'. The disadvantage of such a method is of course that many printers cannot move the paper backwards; also, if features more complex than the ability to plot a line between two points are required, e.g. the plotting of characters, the extension tends to become rather large, leaving less space for your own programs.

A DIFFERENT APPROACH

I therefore opted for a different approach: a short (less than 1K) BASIC extension allows the creation on disk of a sequential plotfile. In a later stage a more complex program turns this file into a plot on the printer, drawn line-by-line. This way you have maximum memory space available in your own programs and you can use printers that can move the paper forward only. Also this method is faster, eliminating many unnecessary movements of the printhead.

AN IMPORTANT REMARK

These programs make extensive use of floating-point routines in the BASIC and KERNAL ROM; however, Commodore did not define vectors for these routines and the possibility cannot be entirely ruled out that versions of the C64 are in existence on which these programs won't! (they were written for the 64-mode of an old C128). Also, if the presence of a cartridge causes problems you should remove it!

OTTER

On the disk (of course you made a safety copy!) you'll find the following files:

TABLE1

	TYPE	BLOCKS
SIMPLEX64	P	4
COMPLEX64	P	3
DUPLEX64	P	9
COMPLEX/CHRMAKER	P	31
COMPLEX64.PDEF	S	1
DISPLAYCHARS	P	8
COMPLEX64/PDEF	P	11
COMPLEX64/2	P	58
COMPLEX64.CR	S	10
FIGURE1	S	4
FIGURE2	S	4
FIGURE3	S	5
TABLE4	S	11

In the article many files are discussed in detail, if not referred to, a file is used by one or more of the others.

GENERAL INFORMATION

Before describing the new BASIC commands we will first discuss some important items. First, the coordinate system to be used. If you take a look at figures 2 and 3 (the large'open' arrow is the direction in which the paper is fed out of the printer) the definition of the axis is clear; the origin is defined as the leftmost position of the printhead on top of the page; the Y-coordinate can have values from 0 to 8 inch, the X-coordinate ranges from 0 to over 150 inch (in case of 12 inch page length the plot can be over 12 pages long!). If you try to plot anything outside this region (i.e. y<0, y>8 or x<0) that particular part of the plot is ignored without jamming the plot programs. However, there is no test for the maximum x-value, if too large a value is used it will produce weird plots. It is also possible to define a new origin, but the old limitations remain: if e.g. the new origin is at x=2, y=3 then in the new coordinate system x-values can range down to -2, the new y ranges from -3 to +5.

Some printers, e.g. the STAR LC-15, can handle paper of a larger width than the standard 10 inches; the programs can use these printers as well, however, the additional width is not used (the size of the internal buffer used limits the useable area to 8 inches).

SIMPLEX64 - NEW BASIC COMMANDS

On the disk you'll find a small file (4 blocks) named SIMPLEX64; this is the BASIC extension, loading from $C000 (49152) to $C373 (50035) (all other memory is free for your own use). The recommended procedure is to copy this file to the disk on which you're developing your own program (any file copier will do). Your own program should first load and start the extension, e.g. as follows:

```
1 N=N+1  :  IF N=1  THEN LOAD"SIMPLEX64",8,1
2 SYS 49152
3 .....
```

The extension is active from line 3 onwards. It operates in an old fashioned manner: all new commands start with the '@' sign and are not tokenised. This implies that they are either to be first on a new BASIC line, or else are to be proceeded by a colon(":") also if it would not be required by normal syntax rules such as in:

```
999 IF I>0 THEN:@PLOT X,Y,P
```

In table 2 you'll find a summary of the new BASIC commands, remember that as for ordinary BASIC statements all parameters may be variables, constants or expressions!

TABLE 2

@OPENPLOT (filenumber)
@SCALE (factor)
@ITALIC (angle)
@PLOT X,Y,PEN,[,DASH]
@ELLIPS X,Y,PEN,X0,Y0,ROT [,SA][,SB]
@SYMBOL X,Y,PEN,H,W,ROT,(arglist)
@OPENPLOT (filenumber)

You should open the sequential plotfile yourself, this instruction tells the extension which logical filenumber to use (should you forget this then a 'PLOT FILE NOT OPEN' error will follow on the first attempt to use one of the plot commands). A logical continuation of the earlier example would be:

```
3 OPEN2,8,2,"TESTPLOT,S,W"
4 @OPENPLOT 2
5 .....
```

Remember that you have to close the plotfile yourself (CLOSE2). Although the new commands work in both 'direct' and 'program' mode you should not mix the two: the OS refuses to write to a file in program mode if it was opened in direct mode!

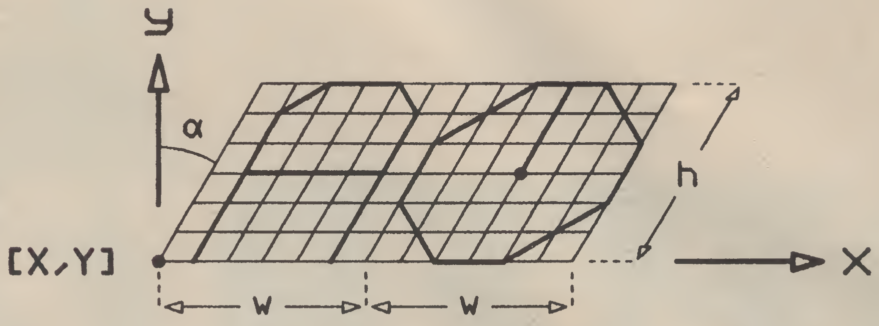


FIGURE 1: SYMBOLS

THE NEW COMMANDS

@SCALE (factor)

Normally, the program assumes inches (factor = 1). You may define a new unit of length using the @SCALE command, if you prefer centimetres the following instruction will do:

999 @SCALE 1/2.54

The obvious place for this command is immediately following the @OPENPLOT command but it is not forbidden to give it in some other place or to change scale more than once.

@ITALIC (angle)

This command is relevant only if you plot characters using the @SYMBOL instruction (see below). The current value of 'value' determines the 'skewness' of the characters. 'Angle' is given in degrees, allowable values are from 0 (normal characters) to 60 (very italic writing). You may change this value as often as you like.

@PLOT X,Y,PEN [,DASH]

This is the most fundamental new BASIC command, it moves the printhead in a straight line from the previous plot position to the specified new co-ordinates [X,Y]. This may be done with 'pen up' (nothing on paper!) or with 'pen down': three different 'pens' (=line widths) are available. You may also plot a dotted line with a single instruction.

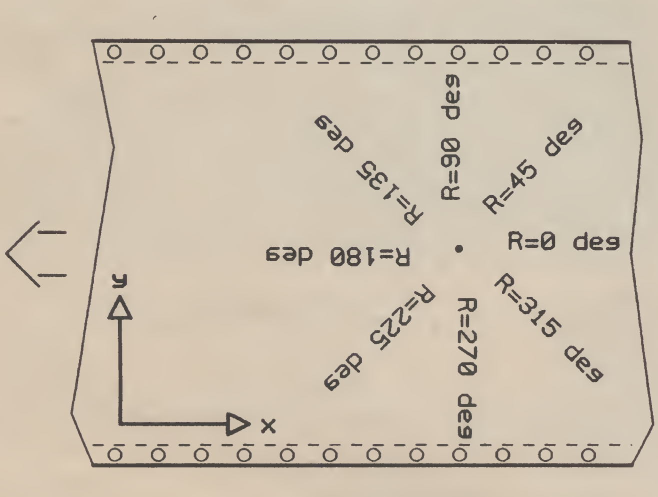


FIGURE 2

The 'previous position' is [0,0] at the start of the program, else the latest coordinates used in a @PLOT instruction (coordinates used in between in 2SYMBOL - or @ELLIPS commands do not effect this value). Forgetting the optional DASH parameter for the moment, the allowable values of PEN and their meaning are as follows:

PEN=0 :	**pen up, no line**
PEN=1-3:	**pen down, a line is drawn with a width of 1, 3 or 5 dots respectively**

It should be noted that for, PEN=2 or 3, the actual line width can vary by 10% depending on the direction of the line to be drawn. This is due to the unequal resolution in X- and Y- direction.

You can use the DASH parameter to draw a dotted line (equal lengths for dots and spaces, unit of length as defined by @SCALE command). The actual length may differ slightly from the value you specify and also varies with the direction of the line. Also, the maximum length of dots and spaces is limited to up to 1.1 inches (2.8 cm). Alternatively, you may draw a dotted line yourself, using a series of @PLOT instructions. This additional option works for all values of PEN, although it does not make sense to use it with PEN=0.

An additional option is invoked by using PEN=(0-3)+256. The effect is as for PEN=0-3 but in addition, the coordinates (X,Y) are used from now on as origin of the coordinate system. Note that on the edges of the plot lines drawn - with PEN=2 or 3 - can be drawn only partially since part of the line width is outside the printable area. The @PLOT command requires very few bytes in the plot file and is handled very efficiently in the actual plotting program.

@ELLIPS X,Y,PEN,X0,Y0,ROT (,SA)(,SB)

With this command you can plot CIRCLES or ELLIPSES, complete or in part. The coordinates (X,Y) are the focus of a circle or the midpoint of the ELLIPSE. X0 and Y0 are the lengths of half the major axis (or, if equal, the radius of a circle), ROT (in RADIANS) is the angle by which an ELLIPSE is rotated with respect to the axis of the coordinate system (irrelevant in case of a circle). From figure 3 you will see that the rotation (RHO) is defined positive for a counter-clockwise rotation.

If you omit the parameters SA and SB these are taken to be zero and the complete ELLIPSE or circle is plotted. You may use SA and SB to define the start and end values of a segment (in RADIANS), compare LAMBDA in figure 3. Notice that a value of e.g. 45 degrees is in general not halfway 0 and 90 degrees, this is only true in the case of a circle.

You select the desired line width by using PEN=1-3, the redefinition of the origin by means of PEN=256+(1-3) also works although it is of little use here. You could plot an ELLIPSE yourself, using a series of @PLOT commands, by writing down the parameter equations and calculate the coordinates for succeeding values of the parameter. The ELLIPSE is then approximated by a large number of small lines, the accuracy depends on the number of steps you choose. The method in this program plots an ELLIPSE with maximum accuracy for the given printer resolution. The price to pay is time; a large number of floating point calculations is required. On the other hand the definition of an ELLIPSE requires little space in the plot file.

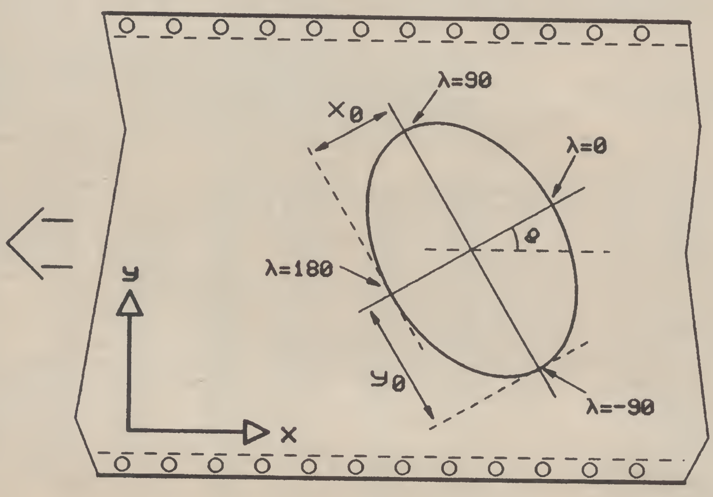


FIGURE 3

@SYMBOL X,Y,PEN,H,W,ROT,(arglist)

This command enables you to plot alphanumeric strings, starting on any coordinates and under the angle you choose. X and Y define the origin of the string (two possibilities, see below), PEN the line width (again, PEN=PEN+256 redefines the origin). H and W are the height and width respectively for each character (in inches, unless altered by the @SCALE command); together with the current value of 'angle' (may be changed by an @ITALIC instruction) they determine the shape of the characters. ROT is the angle with respect to the X-axis for plotting the string, compare figure 2. ARGLIST is the string to be plotted (variables, expressions or constants); it is terminated (either explicitly or implicitly) by CHR$(13). Table 3 shows the symbols that are available by default. There are two types which differ in the way the origin is defined;

CENTRED SYMBOLS - These are CHR$(1)-CHR$(12). The origin (X,Y) is defined in the centre of the symbol (the fat dot in the middle of the right symbol in figure 1) which is defined on the points of a 7*7 grid. These symbols are meant to mark e.g. discrete points on a curve that is to be plotted. They are usually used with an ITALIC angle of zero and equal values for H and W as in;

999 @SYMBOL X,Y,2,.5,.5,0,CHR$(1)

(since the statement does not end with a semicolon the delimeter CHR$(13) is added implicitly).

NORMAL CHARACTERS - For all other symbols the origin is defined at the bottom-left of a grid of 7*7 lines (see "A" in figure 1). Note that the left and rightmost lines are not used and the actual width of the character is 2/3 W (the space between two characters is 1/3 W). The symbols 14-31,96 and 123-149 are special GREEK and MATHEMATICAL symbols that are not in the Commodore set normally. Numbers 32-95 and 97-149 are the important characters from Commodore's Business mode, they contain all normal and most 'shifted' characters (table 3). The following are some examples;

991 @SYMBOL X,Y,PEN,H,W,ROT,A$
992 @SYMBOL X,Y,PEN,H,W,ROT,A$+"abcd"
993 I=2:@SYMBOL X,Y,PEN,H,W,ROT,I

In general this command operates like a PRINT or PRINT# instruction (but you may not use control characters), it has roughly the same possibilities and limitations.

The @SYMBOL command is a complex instruction which - in the plot program - requires quite a few floating point calculations. Also, each command requires, apart from the length of the string to be plotted, an 'overhead' of 14 bytes. Therefore, the @SYMBOL command is not meant to plot pages and pages of text but rather to plot legends and titles accompanying graphics etc. If you do not like the fonts that are supplied or if you need to use other symbols then the ones incorporated in the default file, there is a program on the disk allowing you to create your own symbols.

@KILL

This command disables the extension, the vectors for interpreting the Basic text are restored to their default values. Also the values of the latest co-ordinates and origin are reset to [0,0] and the italic-angle is set to zero. You can use this to start a new plot "from scratch":

```
6   CLOSE2
7   @KILL : SYS49152 : REM
    RESTART
8   OPEN2,8,2,"NEWPLOT,S,W"
9   @OPENPLOT2
10  .....
```

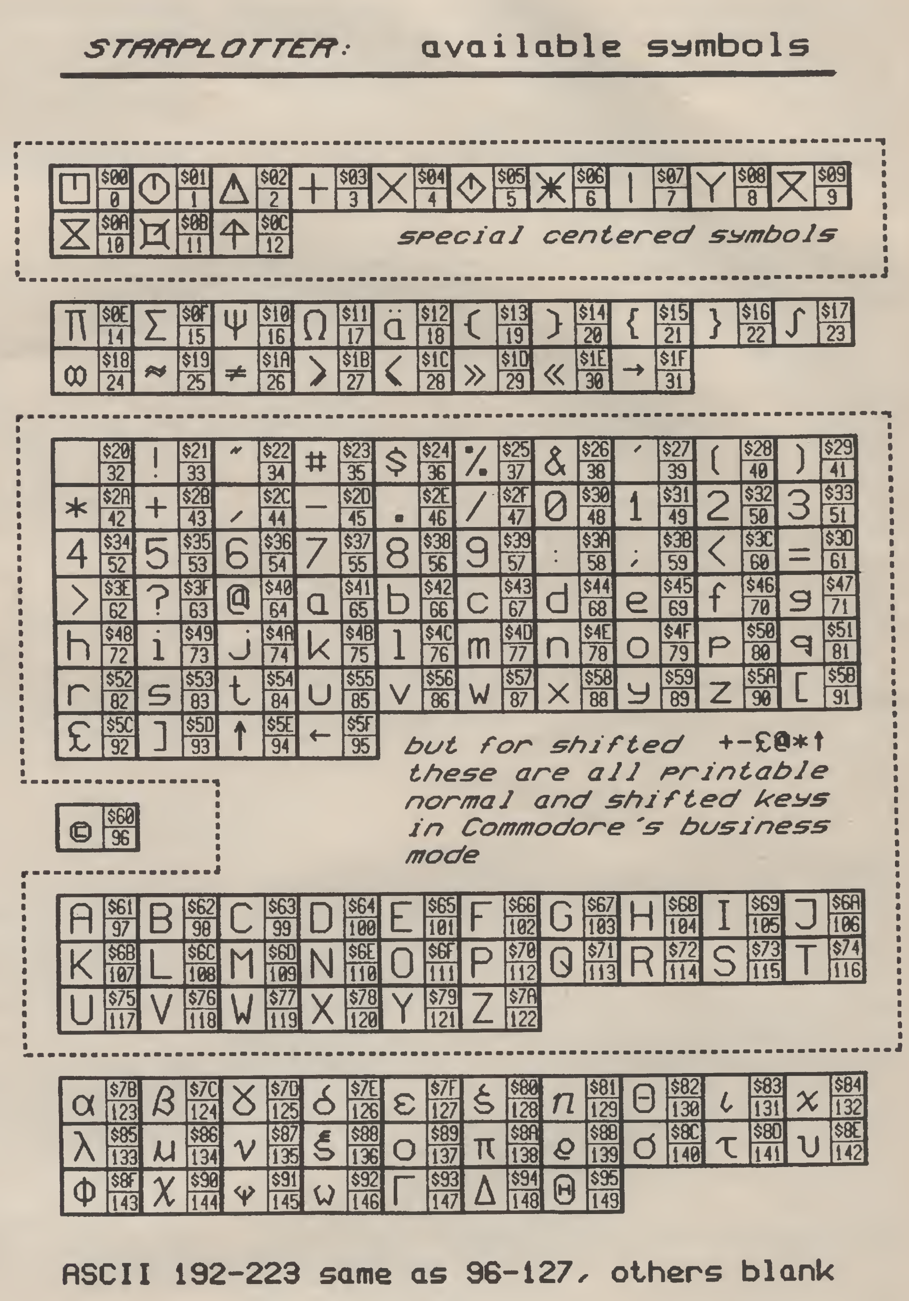
Note that the value of the scale factor (@SCALE) is not reset!

TIP

As explained previously you can choose from three line widths. For PEN=3 the width is at least 0.02 inch (0.5mm) for a line parallel to the X-axis (lines parallel to the Y-axis are a little wider due to the lower resolution in X-direction). Should you want to plot even fatter lines you should redraw the line with an offset of 0.02 inch, fatter ELLIPSES and characters may be obtained in a similar way.

STRUCTURE OF THE PLOTFILE

If your intention is only to use the BASIC extension you may skip this part. It is possible to create the plotfile 'manually'; when writing assembler programs this is the only way but even from BASIC this method has it's use, e.g. if SIMPLEX64 cannot co-exist with another indispensable BASIC extension (or in the 'native' mode of a C128). Note that features like SCALE and the redefinition of the origin are a luxury restricted to the BASIC extension, in the 'manual' method the origin is fixed at [0,0] and the co-ordinates are given in plotter-increments! You'll find a summary in table 4, a further discussion follows below.



STARPLOTTER: available symbols

special centered symbols

□	$00	0
⦶	$01	1
△	$02	2
+	$03	3
X	$04	4
◇	$05	5
✳	$06	6
|	$07	7
Y	$08	8
⊠	$09	9
⧗	$0A	10
⌧	$0B	11
↑	$0C	12

π	$0E	14
Σ	$0F	15
ψ	$10	16
Ω	$11	17
ä	$12	18
(	$13	19
)	$14	20
{	$15	21
}	$16	22
∫	$17	23
∞	$18	24
≈	$19	25
≠	$1A	26
>	$1B	27
<	$1C	28
»	$1D	29
«	$1E	30
→	$1F	31

	$20	32
!	$21	33
"	$22	34
#	$23	35
$	$24	36
%	$25	37
&	$26	38
'	$27	39
(	$28	40
)	$29	41
*	$2A	42
+	$2B	43
,	$2C	44
-	$2D	45
.	$2E	46
/	$2F	47
0	$30	48
1	$31	49
2	$32	50
3	$33	51
4	$34	52
5	$35	53
6	$36	54
7	$37	55
8	$38	56
9	$39	57
:	$3A	58
;	$3B	59
<	$3C	60
=	$3D	61
>	$3E	62
?	$3F	63
@	$40	64
a	$41	65
b	$42	66
c	$43	67
d	$44	68
e	$45	69
f	$46	70
g	$47	71
h	$48	72
i	$49	73
j	$4A	74
k	$4B	75
l	$4C	76
m	$4D	77
n	$4E	78
o	$4F	79
p	$50	80
q	$51	81
r	$52	82
s	$53	83
t	$54	84
u	$55	85
v	$56	86
w	$57	87
x	$58	88
y	$59	89
z	$5A	90
[	$5B	91
£	$5C	92
]	$5D	93
↑	$5E	94
←	$5F	95

but for shifted +-£@*↑ these are all printable normal and shifted keys in Commodore´s business mode

©	$60	96

A	$61	97
B	$62	98
C	$63	99
D	$64	100
E	$65	101
F	$66	102
G	$67	103
H	$68	104
I	$69	105
J	$6A	106
K	$6B	107
L	$6C	108
M	$6D	109
N	$6E	110
O	$6F	111
P	$70	112
Q	$71	113
R	$72	114
S	$73	115
T	$74	116
U	$75	117
V	$76	118
W	$77	119
X	$78	120
Y	$79	121
Z	$7A	122

α	$7B	123
β	$7C	124
γ	$7D	125
δ	$7E	126
ε	$7F	127
ς	$80	128
η	$81	129
θ	$82	130
ι	$83	131
κ	$84	132
λ	$85	133
μ	$86	134
ν	$87	135
ξ	$88	136
ο	$89	137
π	$8A	138
ρ	$8B	139
σ	$8C	140
τ	$8D	141
υ	$8E	142
Φ	$8F	143
χ	$90	144
ψ	$91	145
ω	$92	146
Γ	$93	147
Δ	$94	148
Θ	$95	149

ASCII 192-223 same as 96-127, others blank

TABLE 3

For all file entries the first five bytes are:

byte 1 : code byte: bits 6 & 7 determine the value of PEN, bits 0-5 are unique to the instruction.

bytes 2,3 : X in plotter steps (1/216 inch); this number is given as a 16-bit unsigned integer (note: high byte first!). This method explains the maximum plot length (up to 12 pages, see SIMPLEX64: NEW BASIC COMMANDS).

bytes 4,5 : idem the Y-co-ordinate, in steps of 1/240 inch.

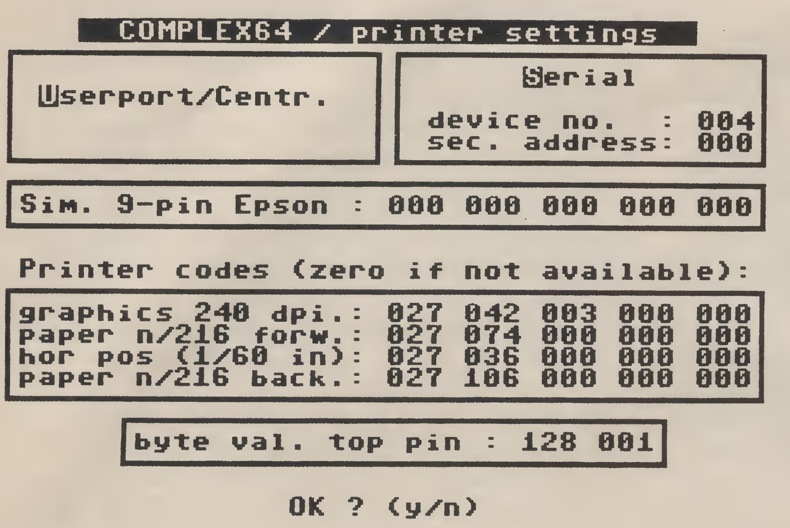
PLOT : depending on the value of the code byte a sixth byte may follow:

byte 6 : DASH, the length of dots and spaces in a dotted line (in plotter steps). Since the plotter step varies from 1/216 tO 1/240 inch it is best to assume an average step of 1/220 inch and take a deviation of up to 10% for granted.

The PLOT instruction uses a Bresenham algorithm to draw a straight line; in view of the unsigned 16 bit integers used, this method is both fast and efficient in the use of memory.

ELLIPS:

bytes 6,7 : 1024*X0 as unsigned 16-bit integer (X0 in inches); this is a memory saving way to store X0 with still high enough precision



```
  COMPLEX64 / printer settings
 Userport/Centr.          Serial
                    device no.   : 004
                    sec. address: 000
 Sim. 9-pin Epson : 000 000 000 000 000
 Printer codes (zero if not available):
 graphics 240 dpi.: 027 042 003 000 000
 paper n/216 forw.: 027 074 000 000 000
 hor pos (1/60 in): 027 036 000 000 000
 paper n/216 back.: 027 106 000 000 000
       byte val. top pin : 128 001
              OK ? (y/n)
```

FIGURE 4

	(remember: high byte first!).
bytes 8,9	: idem 1024*Y0.
bytes 10-14	: rotation (radians), in the shape of a 5-byte floating point constant.

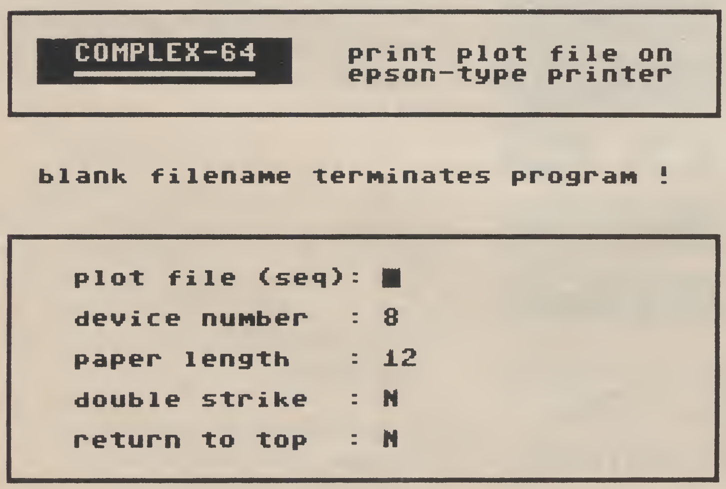
Depending on the value of the code byte there may follow:

bytes 15-19	: starting angle (radians), 5-byte floating point constant.
bytes 20-24	: end angle (radians), idem.

SYMBOL:

bytes 6,7	: 1024*H (height, compare X0 in ELLIPS).
bytes 8,9	: 1024*W (width, compare Y0 in ELLIPS).
bytes 10-14	: rotation in radians (as for ELLIPS).
byte 15	: the ITALIC angle (degrees) to be used for this string. Values may range from 0 to 60 (positive only).

Next there follows a string, terminated by CHR$(13); the maximum length is 255 symbols or characters.



```
 COMPLEX-64        print plot file on
                   epson-type printer

 blank filename terminates program !

   plot file (seq): █
   device number   : 8
   paper length    : 12
   double strike   : N
   return to top   : N
```

FIGURE 5

As far as the maximum size of the plot file is concerned: it is solely limited by the type of drive you use, for the 1541/71/81 this is up to 164/329/783 Kbytes respectively. The plot program to be described in (COMPLEX64: PLOTTING THE FILES) can be handle files of any size but if they exceed the available buffer size (up to 40K) the time required to complete the program increases enormously (PLOT MENU).

COMPLEX64 - PLOTTING THE FILES.

In power-up condition you LOAD and RUN COMPLEX64 as a BASIC program. First however, we must discuss the sequential file COMPLEX64.PDEF! This file contains all relevant information on the printer you use. If this file is present on the same disk as COMPLEX64 execution continues as described in PLOT MENU, if the file is not found you first have to work your way through the printer menu described in PRINTER CONFIGURATION. The file supplied on the disk is for a STAR LC-10 with a commercial centronics - user port cable. If you work with another configuration you should scratch this file first; the very first time you use COMPLEX64 you then have to enter the relevant data for your own printer.

PRINTER CONFIGURATION.

Figure 4 shows a screen dump from the menu screen (the data shown are for a STAR LC-10); on the monitor it is evident which data to enter as the relevant part of the screen is 'highlighted'. A short description:

- The first choice is between a centronics - user port cable or a serial interface (key "u" or "s" respectively). In case of a serial interface you should also define the device number a secondary address (you require a linear channel which transfers the bytes unchanged; for many interfaces such a channel is selected by using the appropriate secondary address).
- Next you can define a string of up to five bytes (it is used up to the first zero byte). This string is sent only once at the very beginning of the plot program and it can be used to force your printer into behaving like an 8-pin Epson type (consult your printer's manual!).
- Next the printer codes are defined for the (only four) printer instructions the program uses. Of these, the first two are absolutely essential (define the graphic mode and move the paper forward by n/216 inch). The third code, used to define the starting position on a particular line in steps of 1/60 inch, can limit the number of bytes to be transferred but the plot can be made without it. Also the fourth code (used to move the paper backwards) is not absolutely essential (see PLOT MENU). All codes are used up to the first zero byte, if the very first byte is zero this implies that your printer does not

have that particular facility.

- For STAR and EPSON printers in graphic mode the dot pattern is defined by adding the values 1, 2, 4, ..., 128 for the corresponding pins. Here the 'top' pin corresponds with the value 128. However, some printers have this sequence reversed i.e. the top pin corresponds with a value '1'. You can choose between the two possibilities using CRSR and RETURN.
- Finally, if you are satisfied key "y" to save the new settings on disk or "n" to do it all over again.

A final note concerns the setting of the dip switches in the printers interior. Normally, these are irrelevant because the program uses a very limited vocabulary to handle the printer. The one exception is if your printer cannot define the start position in steps of 1/60 inch. In this case CR [chr$(13)] is used to (re)position the printhead on the leftmost position on the line; however, the printer must not automatically add a line feed (LF) to the carriage return, usually a dip switch is used to select this option.

PLOT MENU

Figure 5 shows a screen dump of the menu screen, on the monitor the relevant entries are immediately apparent by 'highlighting'. The line beneath the header ("blank file name...") is used as a status/message line. A description follows;

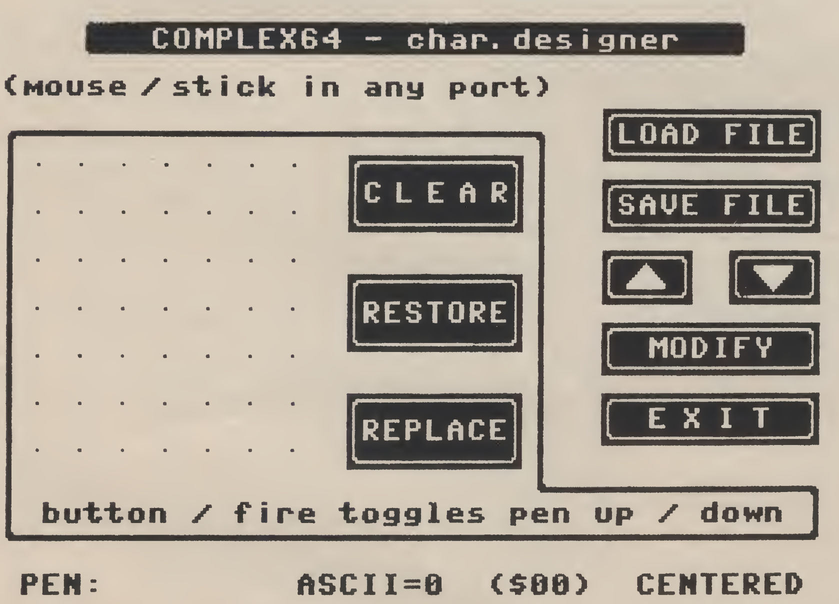
1) The name of the plot file and the device number need no comment.

2) The paper length, normally 12 inches, is relevant only in conjunction with the 'return to top' option. If the latter is off ('n') then a correct paper length ensures that the paper is spooled to the top of the first new page.

3) If the 'double strike' option is on ('y') then each line is printed twice for maximum inking. This may be useful if you need the plot for further graphic purposes.

4) You can select the 'return to top' option only if your printer is able to move the paper backwards (specified in the COMPLEX54.PDEF file). If ON ('y') the paper is moved backwards (dot-precise) to the original position. Possible uses are e.g. the creation of coloured plots by using different coloured ribbons in succeeding steps, or mixing normal print (from another program) with the plot. Also, if you plan to draw plots which require over 40K (the buffer size), careful programming could create several smaller files which, if plotted one after the other, will require much less execution time than the complete file would.

5) Finally, (not shown in figure 5), in the status line you are asked if the plot should be sent to the plotter (key 'P') or to disk ('D'). Normally, you would enter 'P'. However, there are a number of 'LUXURY' plot instructions (ELLIPSE, SYMBOL) that require quite some calculation time; this can amount to several seconds per instruction for each line; if you plan to plot the same file more than once, it is advantageous to divert the byte stream to disk. These are packed, using a simple algorithm, and are stored in a sequential file named SSF.01 (or a higher number for the next file in the same run). Using a separate program (DUPLEX64) you can read the SSF files and send the data to the printer, but this time without having to wait for lengthy calculations in between the lines! Do not get mixed up between normal plot files and the SSF files, they are not mutually interchangeable. Also, when writing the SSF files you can choose between two device numbers. Note that if the SSF file is sent to the same drive as the plotfile is read from, they are of necessity on the same disk.


COMPLEX64 - char.designer

(mouse / stick in any port)

button / fire toggles pen up / down

PEN: ASCII=0 ($00) CENTERED

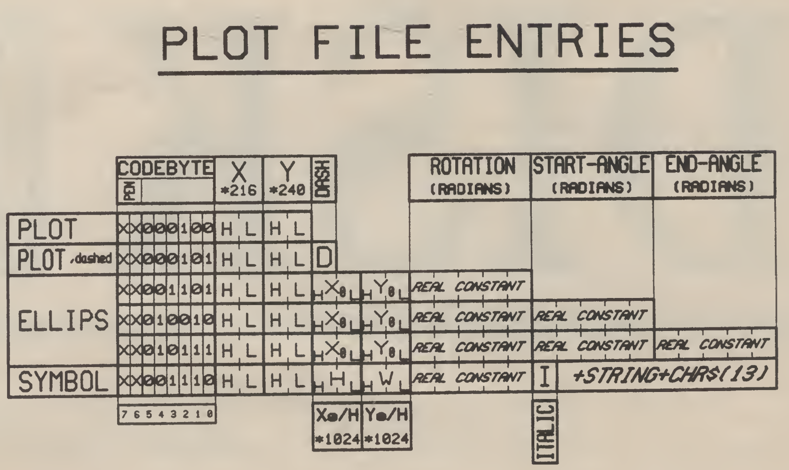
FIGURE 6

SOME IMPORTANT POINTS

A) A possible message in the status line is 'Plot file error'. The program has found an unexpected byte in the plot file, usually this means that the file is not a plot file at all.

B) Prior to showing the menu screen, the program reads the file COMPLEX64.CR which contains the definition of the character set. If you want to change the character set you may create your own (Before executing COMPLEX64). It is not possible to use more than one set at the same time.

C) The available buffer amounts to around 40K bytes. Files exceeding approx 160 blocks can be handled but the overall speed becomes very slow. (Each line requires the complete file to be processed as indicated by the PASS value in the status line). Alternatively, you may create smaller files and 'overlay' these if your printer has the ability to move the paper backwards (see above). However, even the normal buffer size allows the use of over 8000 simple PLOT instructions.



PLOT FILE ENTRIES

	CODEBYTE (PEN)	X *216	Y *240	DASH			ROTATION (RADIANS)	START-ANGLE (RADIANS)	END-ANGLE (RADIANS)
PLOT	XX000100	H L	H L						
PLOT ,dashed	XX000101	H L	H L	D					
ELLIPS	XX001101	H L	H L		H X0 L	H Y0 L	REAL CONSTANT		
	XX010010	H L	H L		H X0 L	H Y0 L	REAL CONSTANT	REAL CONSTANT	
	XX010111	H L	H L		H X0 L	H Y0 L	REAL CONSTANT	REAL CONSTANT	REAL CONSTANT
SYMBOL	XX001110	H L	H L		H H L	H W L	REAL CONSTANT	I	+STRING+CHR$(13)
	7 6 5 4 3 2 1 0				X0/H *1024	Y0/H *1024		ITALIC	

TABLE 4

DUPLEX64

This is the program that plots the SSF files. In power-up condition it is loaded and started as a Basic program. The menu screen is similar to that of COMPLEX64 but you need only specify the file name and device number, the other options were selected in the COMPLEX64 run which created the SSF file). This program does not require files for printer, or character definitions, these are all incorporated in the SSF file. Although an SSF file is handled much quicker than an original plot file, it is usually much larger. Please note that a SSF file can only be printed on the printer type that was specified in the creation of the SSF file. i.e. in a run of COMPLEX64.

COMPLEX/CHRMAKER - DESIGNING CHARACTERS

As discussed previously, you may plot symbols and characters which are defined in the sequential file COMPLEX64.CR. You may change some of the symbols or even create a new set yourself. As usual, in power up condition it is loaded and started as a Basic program (figure 6 shows how the screen will look).

You can control the program with a mouse (Commodore 1351 - in proportional mode) or by a joystick in either port. (The keyboard is not to be used). You can 'CLICK' on one of the icons by pressing either the mouse buttons or the fire button on the joystick. Note that the area in which you can move around it tightly controlled to options that make sense in any particular stage of the program.

At first the cursor is restricted to the rightmost part of the screen (initially it is situated between the 'UP' and 'DOWN' icons). If starting from scratch the work area will be empty. (Apart from a grid). If you plan to design a completely new set of symbols, this is fine, else click on the LOAD'FILE' icon. Using the 'UP' and 'DOWN' icons you may thumb through the symbols. Note that the number and type are displayed on the bottom line. Clicking on 'MODIFY' moves the cursor to the left half of the screen, returning from this you may select another symbol to work on or else you may SAVE FILE.

When on the left half of the screen there are two possibilities; either the PEN is 'UP' or it is 'DOWN'. The meaning of the three icons - CLEAR, RESTORE and REPLACE will be obvious. You can draw a line by positioning the cursor on a grid point and then push the button. There are two ways to continue, clicking on the same position again creates a dot. Moving to another point and clicking there results in a line; the PEN remains down and you may continue the figure or else you may click again and enter 'PEN UP' state and continue the symbol elsewhere on the grid.

If the maximum number of points that can be used in any symbol (around 16) is used, it is shown on the screen and you cannot click other than on one of the three icons in the left half of the screen.

PLOTTING THE CHARACTER SET

If you have created your own set of symbols you may want a table of symbols similar to table 3. To this end the Basic program DISPLAYCHARS is included on the disk. You should (ONCE only) load and run this program, creating the sequential plot file CHARDISPLAY (the Basic program requires much less disk space, therefore it is included on the disk instead of the plot file you actually need).

Plotting this file in COMPLEX64 results in a table similar to table 3, displaying the current symbols defined in the file COMPLEX64.CR.

OTHER FILES ON DISK

Also on the disk are the sequential plot files 'FIGURE1', 'FIGURE2', 'FIGURE3' and 'TABLE4'. If you plot these using COMPLEX64 you will obtain the same illustrations as printed with this article. You might use these as a test until having written some plot applications yourself.

DISK ECONOMISER

Another utility for saving disk storage space appears, this time by courtesy of - SIMON COLLIS

This program is designed to fill up the nooks and crannies on those disks - to ensure that you have disks full of programs, and leave not a block free. Why? Because by filling the disk, you ensure that you use less disks (makes sense really, doesn't it?) and therefore SAVE MONEY. Once you've loaded DISK ECONOMISER (either through the CDU MENU, or by typing LOAD"DISK ECONOMISER",8 followed by RUN) you enter the main menu, which will show you the following options:

B BLOCK SEARCH
S FULL DISK SEARCH
R READ DIRECTORY TO MEMORY
M MANUAL ENTRY TO MEMORY
L LIST FILES IN MEMORY
D DELETE FILES FROM MEMORY
C CLEAR ALL FILES
P PRINTER
@ DOS COMMANDS
X EXIT TO BASIC

BLOCK SEARCH

Allows you to enter the number of blocks that you wish to search the memory for. By default I have set this to 664 (the size of an empty 1541 disk), but you can set it to any size you want, to allow for partially filled disks, 1581 drives (3160 blocks), and so on. The maximum number of blocks you can search for is 9999, but Disk Economiser will tell you if it the files in memory don't comprise enough blocks to complete the search.

FULL DISK SEARCH

Allows you to search for the number of blocks that you specified in BLOCK SEARCH. Disk Economiser is all machine-code and searches at a very high speed - over 10,000 combinations of files per second, although it has also been streamlined to reject combinations which would be too many or too few very quickly.

READ DIRECTORY TO MEMORY

Allows you to put a disk in the drive, and then presents a menu of the directory, with the cursor at the end of the first filename. Zero blocks boot and directory separators (provided they are shown as being zero blocks long) are ignored (but shown for completeness).

When the cursor is on a filename, press "Y" to enter the file into memory (along with the diskname and disk identity of the disk that it came from) and "N" to ignore it. After pressing one of the keys, there will be a small delay before the next filename is displayed. Even the type of program is kept.

NB: when using this option, insert the disk into the drive BEFORE you press the letter, or the program will crash.

MANUAL ENTRY TO MEMORY

Allows you to enter the name of a file, and the length in blocks. It shows up in all listings with file-type "MAN", and the disk-name/identity shows up as "MANUAL ENTRY". Press RETURN on an empty filename to leave this mode and return to the menu.

LIST FILES IN MEMORY

Will list the files the program has in memory so far. Disk Economiser can hold up to 256 files, but you shouldn't usually need so many. Incidentally, it also takes a long time to sort through 256 files, so if you ever do fill the memory, be prepared for a long wait. It's preferable to have a book to read (eg "War and Peace") but Disk Economiser has been set up to try and find a combination as fast as possible, so please be patient - the longest I spent waiting was about a minute, with 256 files in memory, so it's not that slow. (or perhaps "Spot the Dog" instead!)

DELETE FILES FROM MEMORY

Pretends to be a dos wedge, but with the scratch command built in. The "*" and "?" wildcards are interpreted correctly, and every file selected is brought up on screen and confirmation is requested for every deletion.

CLEAR ALL FILES

Is a much faster way of clearing all the files than using the above. It doesn't ask for confirmation at all, and the screen blinks when it's finished. So be careful not to press it (although I usually find I never make these sort of errors until someone warns me about them, so perhaps I shouldn't have said that!)

PRINTER

Selects between serial printer (4, 5, 6 and 7) or Centronics (or, indeed, no printer). If a printer is selected, once an arrangement for a disk is accepted, the arrangement will be sent to the printer as specified by the menu, complete with block lengths, filenames, file types, disk names and disk identities.

DOS COMMANDS

Allows you to do whatever you want with a disk, provided CBM-DOS supports it. The disk error is read back, so turn the drive off and on again, rather than type "UJ" to reset a drive!

EXIT TO BASIC

Exits to BASIC by resetting the machine.

Well, that's the menu finished, now for a few notes. Everything, except during a search, don't worry about the flashing, because that's just there to tell you that it is still working on it, please don't be disturbed. In tests, I waited no longer than a minute with 256 files in memory (this is after the seek time (slower flashing) has finished, add about 15 seconds for this) and no longer than 1 second with 30 files (again, add 15 seconds for seek time (when the list is taken from memory and processed for faster access)).

Disk Economiser is programmed to automatically use the drive it was loaded from when it is first run. If this you want to use the program with a different drive than you loaded it from, type POKE2145,<drive-number> before you run.

If you decide to change drive number while using the program, type "X" to return to BASIC, use the POKE above, and type SYS2066. Of course, the POKE can be omitted if you have accidentally triggered "X", but I didn't really need to tell you that, did I? No, of course I didn't. Are there any more things I don't need to tell you? King Henry VIII is dead, for example ... or perhaps that Paul Eves is the editor of CDU ... (Fraid not Simon, PAUL EVES no longer reigns over CDU, sorry!! or maybe ... (that's enough of that - Ed)

CLASSIFIED COUPON

ALL CLASSIFIED ADVERTISEMENTS MUST BE PRE-PAID.
THERE ARE NO REIMBURSEMENTS FOR CANCELLATIONS.

CDU CLASSIFIED DEPARTMENT, ALPHAVITE PUBLICATIONS,
20 POTTERS LANE, KILN FARM, MILTON KEYNES, MK11 3HF.

RATES:Lineage 58p per word (+VAT). Semi-display: £11.50 (+VAT) per single column cm minimum size 2cm. Series discounts available.

I enclose my Cheque/Postal Order for £..................for ....insertions, made payable to Alphavite Publications.
(Delete as necessary)

CARD NO.: □□□□□□□□□□□□□□□□ PLEASE DEBIT MY ACCESS/VISA

EXP. DATE:..

£...................................FOR..........................INSERTIONS

Name:..

Address:..

....Post Code:...........................

Daytime Tel No.: ....

Signature: ....Date:.....................................

□ FOR SALE □ SOFTWARE □ SPECIAL OFFERS □ OTHER

GEOgrab

J. O'DONNELL shows you how to convert Geowrite USR files to Sequential files

This program enables you to export GEOWRITE files to other word processors or view the USR files without booting GEOS. It is fast, smooth and efficient. Written entirely in machine code, it offers high speed, smooth scrolling and user friendly routines.

GEOGRAB V2 will read a GEOWRITE USR file and convert it into a SEQ file that will load straight into PAPERCLIP III, SUPERSCRIPT, B.B. WRITER and FONTMASTER II, maybe more. All of them loaded the SEQ file without a hiccup. SUPERSCRIPT signalled an error, but on examination the file had loaded intact. The resulting SEQ file contains absolutely no formatting except for carriage returns. This means that the file will still maintain its original paragraphs but lose any other layout features, such as margins, tab settings etc..

HOW TO USE GEOGRAB

To use the program, select it from the CDU menu or type; LOAD"GEOGRAB V2",8 <RETURN>. When the load is complete, type RUN <RETURN>.

The title screen has a four choice menu.

1. LOAD
Load a GEOWRITE USR file. Follow the screen prompts and you can't go wrong. When entering the filename you may use upper or lower case or both. During the load the drive light will flicker a little, this is normal. If several files are to be converted they may be done in succession. Each new load will overwrite the previous one.

2. VIEW.
You can view the file currently held in memory. Press V and the file will scroll up the screen (smoothly) and stop when the end is reached. Press SHIFT to pause the scroll or SHIFT LOCK to hold it.

3. WRITE.
Write the text into a sequential file using the same name that was used during the load. Again, just follow the prompt. You should have a destination disk at hand.

4. DIRECTORY.
View the directory of the disk currently in the drive. As the screen is in lowercase mode, the GEOS directories are rendered readable. Viewing a directory will not interfere with any file in memory.

TECHNICALITIES OF GEOGRAB

GEOGRAB V2 is written entirely in machine code. The heart of the program is a BLOCK READ direct access routine. This routine is used extensively to access the GEOWRITE disk.

First the directory is read one block at a time and tested for USR files. Each USR entry is compared against the given filename until the desired file is found, along with the pointer to the first block of the file. The first block is an index to the pages of the document. Bytes 1 & 2 are links to the next block in the index and usually contain #$00 and #$FF respectively, indicating the end of the index. One block can hold 127 entries and so it is unlikely that a further block would be needed. Bytes 3 & 4 hold the track and sector of the first block in page one. Bytes 5 & 6 point to page two, 7 & 8 to page three and so on.

The pointer to the first block of page one is read, each successive block holds a link to the next in bytes 1 & 2. When the first byte is a zero then this is the last block in the page and the second byte indicates how many relevant bytes remain to be read from the block. We can now go back to the index and get the pointer to the first block of page two. If the first byte of the pointer is a zero then there are no more pages and we have reached the end of the document.

GEOGRAB V2 runs in basic RAM starting at $0801 and ending at $0EE0. $0F00 to $0FFF is used as an input buffer for each block read from the disk. After the first block of the file is read, the index block, it is transferred to $1000 for easy access during the remainder of the process. All other blocks are processed in the input buffer at $0F00. The BASIC interpreter is flipped out to give contiguous RAM from $1100 to $CFFF for your documents. This is 49K, and should be large enough to cater for the longest files.

The sequential write routine is a standard procedure using Kernal ROM routines. Every effort has been taken to ensure that the finished file contains only PET ASCII text characters, giving a high degree of compatibility with popular word processors.

FILE UTILITIES

We bring you JOHN CAMPBELLs' final three programs that make up the FILE MENU suite of programs

This month we bring to you FILE DIFFER, FILE LISTER and FILE CROSSREF. To finish up with, we have also included a simple demonstration program for putting all the previous ten parts of this utility into practice. I am sure that many new users of the Basic language will find this suite of programs an invaluable aid to their learning skills.

FILE DIFFER

The File Differ program allows the Basic programmer to compare two versions of a Basic program to determine how they differ. The utility compares the two disk files you indicate and produces a report showing the lines from each file which contain differences. Sections of the two files which are identical are not reported. This capability is useful to a programmer to determine what caused a working version of a program suddenly to stop working in a subsequent version. It can also be used to verify that the File Replacer utility replaced only those strings you intended to replace.

When you select the File Differ utility from the Menu, it is loaded and run. The utility first asks you to supply the names of the two existing Basic files which you wish to compare:

NAME OF INPUT FILE?

You enter the name of the disk file where the first program is stored and press the RETURN key. (Note, the order in which you specify the two files does not matter; the report will show the same differences.)

Next, the utility asks for the second file to be compared:

NAME OF SECOND INPUT FILE?

You enter the name of the second program file and press the RETURN key.

Now the utility asks you to specify whether you wish the differences to be displayed on the screen or printed on the printer:

OUTPUT TO SCREEN OR PRINTER (S OR P)?

You enter S and RETURN to have the differences displayed on the screen, or P and RETURN to have the differences sent to the printer.

Finally, File Differ asks you to indicate whether line numbers should be compared, along with the Basic line, or whether just the Basic lines themselves should be compared, ignoring line numbers:

COMPARE LINE NUMBERS (Y OR N)?

You enter Y (for Yes) and RETURN if you wish to have the line numbers compared, otherwise you enter N (for No) and RETURN. (Note, even when you elect not to compare line numbers, functionally identical files may still show differences due to GOTOs and GOSUBs referencing different line numbers.)

Once you have entered all the information, File Differ begins its work. The utility reads a line from each input file, and compares them character for character. If they match, the lines are ignored, and two new lines are read. If the lines are different, they are stored away, and again two new lines are read. The new line from the first file is compared with the new line from the second file, along with every line stored away from the second file. If all comparisons continue to show differences, the old lines are stored away and new lines read.

When identical lines are finally found, the differences found to that point are reported, either to the screen or printer, depending on which you indicated. The different lines stored from the first file are printed, followed by the lines stored from the second file, with a short row of asterisks to separate them. In addition, a long row of asterisks is printed to separate this section of differences from the next section. When a short row of asterisks is followed immediately by a long row (or vice versa), it indicates either a set of lines were deleted from one file or a set of lines was inserted into the other file.

When an end-of-file is encountered in one of the input files, the currently-stored difference lines are output, along with the remaining lines in the other input file.

There are four possible error messages you may get from File Differ.

1. ERROR—FILE NOT FOUND

File Differ could not find the original file which you want to merge with another. You need to check the spelling of the file name, and make sure that file is on the disk. Then run the program again with the correct file name.

2. ERROR—EXCEEDED SIZE OF ARRAY

File Differ ran out of space while storing differences. If this error occurs, it is safe to assume that the two input files are sufficiently different to be considered unrelated to each other.

3. NO DIFFERENCES FOUND

File Differ found no differences between the two input files. Functionally, they are identical. (If you elected to compare line numbers as well, the two files are absolutely identical.)

4. ERROR—FILE MENU NOT FOUND

This error occurs when you elect to load the File Menu after completing execution of the utility, but it is not found on the disk. You are prompted again to enter your choice, which gives you the opportunity to insert the proper disk into the drive before responding.

FILE CROSSREF

The FILE CROSSREF program allows the Basic programmer to obtain a cross reference of all variables found in a program and the lines where each is used. The utility also indicates in which lines a variable is set by printing an "=" after the line number. In addition, FILE CROSSREF produces a cross reference of subroutine calls in the program, and the lines where each GOSUB occurs. This report allows the programmer to identify everywhere a variable is used but never set, and everywhere a variable is set but never used. In most cases, these conditions are errors to be corrected. This report can be used as well to identify mistyped or misspelled variables. It also allows the programmer to locate all occurrences of a particular variable, in order to determine whether or not a variable with the same name has been employed for conflicting purposes.

When you select the FILE CROSSREF utility from the Menu, it is loaded and run. The utility first asks you to supply the name of the Basic file for which you want to obtain a cross reference:

NAME OF INPUT FILE?

You enter the name of the disk file where your program is stored and press the RETURN key.

Next, the utility asks you to specify whether the cross reference is to be displayed on the screen or printed on your printer:

OUTPUT TO SCREEN OR PRINTER (S OR P)?

You enter S and RETURN to have the cross reference displayed on the screen, or P and RETURN to have the it sent to the printer (make sure the printer is ready).

Once you have entered that information, FILE CROSSREF begins its work. The utility reads your program file line-by-line, updating the display screen each time to let you know how many lines it has found. It identifies the variable names and/or function names in the line, and determines whether or not they are being set. A record of each variable is created, and the line number is stored as part of the record. For each new line read, variable names are extracted, and the line number is added to the variable name record if it exists, or a new record is created. Subroutine (GOSUB) records are handled analogously, where the line number called by the GOSUB identifies the record.

After the whole program file has been read, a report is displayed on the screen or printed on the printer, depending on which you selected. This report first lists each variable in alphabetical order, along with all the lines in which that variable occurred. An "=" character next to the line number serves to indicate the variable was set in that line of the program. Then the report lists each subroutine in numerical order, along with the lines in which that GOSUB occurred. If no subroutines were called in the program, a notice to that effect is displayed/printed.

There are three possible error messages you may get from FILE CROSSREF.

1. ERROR—FILE NOT FOUND

FILE CROSSREF could not find the original file from which you want to extract lines. You need to check the spelling of the file name, and make sure that file is on the disk. Then run the program again with the correct file name.

2. ERROR—NO MEMORY TO COMPLETE XREF

FILE CROSSREF is designed to optimize its use of memory such that programs with many lines and programs with many variables are handled equally well. If you get this error, your program exceeded the capacity of FILE CROSSREF to handle a large combination of lines and variables. The capacity can be calculated as (6*V)+(5*G)+(2*L), where V is the number of different variables, G is the number of different subroutines, and L is the number of different lines where each variable occurs (the line record is duplicated for each different variable and GOSUB in the line). When this quantity exceeds 5000, you get this error.

3. ERROR—FILE MENU NOT FOUND

This error occurs when you elect to load the FILE MENU after completing execution of the utility, but it is not found on the disk. You are prompted again to enter your choice, which gives you the opportunity to insert the proper disk into the drive before responding.

FILE LISTER

The FILE LISTER program allows the Basic programmer to list a program to the screen or printer. This capability allows the programmer to obtain a listing of the file previously extracted, renumbered, merged, or produced from a search and replace, without having to exit the FILE UTILITIES, load the file, List it, and reload the File Utility menu.

When you select the FILE LISTER utility from the Menu, it is loaded and run. The utility first asks you to supply the name of the Basic file to be listed:

NAME OF INPUT FILE?

You enter the name of the disk file where your program is stored and press the RETURN key.

Next, the utility asks you to specify whether the lines are to be displayed on the screen or printed on your printer:

OUTPUT TO SCREEN OR PRINTER (S OR P)?

You enter S and RETURN to have the lines displayed on the screen, or P and RETURN to have the lines sent to the printer (make sure the printer is ready).

Once you have entered all the information, FILE LISTER begins its work. The utility reads your program file and translates the Basic keyword tokens into their ASCII string equivalents. It then displays the listing on the screen or sends it to the printer, depending on what you indicated.

There are two error messages you may get from FILE LISTER:

1. ERROR—FILE NOT FOUND

FILE LISTER could not find the file to be listed. You need to check the spelling of the file name, and make sure that file is on the disk. Then run the program again with the correct file name.

2. ERROR—FILE MENU NOT FOUND

This error occurs when you elect to load the FILE MENU after completing execution of the utility, but it is not found on the disk. You are prompted again to enter your choice, which gives you the opportunity to insert the proper disk into the drive before responding.

FILE UTILITIES DEMO

This write-up describes a demonstration which can be run in under fifteen minutes to illustrate how the FILE UTILITIES may be used together in developing Basic programs. For the demonstration a file called DEMO FILE has been included on the disk. You as the programmer wish to rearrange some lines in the program and change the message output at the end of the run. The demonstration will use the different utilities to make those changes. Of course, in the simple file used, the most expedient thing to do is edit the file directly. The real power of the FILE UTILITIES comes in their use with programs which are so large as to make manual editing difficult and error-prone.

1. Start the demonstration by loading TEST FILE from disk and running it. You will see the following output on the computer screen:

```
A= 0
```

```
A= 1
A= 2
A= 3
A= 4
A= 5
A= 6
A= 7
A= 8
A= 9
END OF TEST
```

2. Now load and run FILE MENU, and select item 9 - FILE LISTER, to get a hard copy of the DEMO FILE.

   a. List DEMO FILE to Printer. (You may want to do a printer form feed after each transmission to the printer in this demonstration.)
   b. Return to FILE MENU.

3. Select item 2 - FILE EXTRACTOR, to extract the subroutine to be moved.

   a. Input from DEMO FILE, output to DEMO EXTR.
   b. Extract lines 1000 to 1500.
   c. Return to FILE MENU.

4. Select item 3 - FILE DELETER, to delete the subroutine to be moved (plus the GOTO ahead of it).

   a. Input from DEMO FILE, output to DEMO DELE.
   b. Delete lines 500 to 1500.
   c. Return to FILE MENU.

5. Select item 1 - FILE RENUMBER, to renumber the file after the subroutine was deleted.

   a. Renumber file DEMO DELE, output to DEMO RENU.
   b. Start renumbering from line 100 with increment 10 between lines.
   c. Return to FILE MENU.

6. Select item 4 - FILE MERGER, to merge the subroutine back into the renumbered file.

   a. Merge files DEMO RENU and DEMO EXTR, output to DEMO MERG.
   b. Return to FILE MENU.

7. Select item 11 - DISK COMMAND.

   a. Enter "$0:DEMO*", to get a directory of all the demo files created so far.
   b. Select output to go to printer.
   c. Type RETURN to get back to the menu.

8. Select item 5 - FILE SEARCHER, to find all instances of the string "END" in the DEMO files.

   a. Search files DEMO* for string END.
   b. Select output to go to printer.
   c. All demo files listed in the directory in the previous step are searched.
      Note that only the END strings in REM statements and string constants enclosed in quotes are displayed, not the END statement since it is a Basic token.
   d. Return to FILE MENU.

9. Select item 6 - FILE REPLACER, to replace the "END" strings in the merged file.

   a. Replace string in DEMO MERG, output to DEMO REPL.
   b. Find string "END" and replace with string "COMPLETION".
   c. Return to FILE MENU.

10. Select item 7 - FILE DIFFER, to check how the new file has changed from the original file.

    a. Compare DEMO REPL to DEMO FILE.
    b. Do not compare line numbers.
    c. Select output to go to printer.
    d. Return to FILE MENU.

11. Select item 8 - FILE CROSSREF, to obtain a cross reference listing of the new file.

    a. Enter input file DEMO REPL.
    b. Select output to go to printer.
    c. Return to FILE MENU

12. Select item 9 - FILE LISTER, to obtain listings of the DEMO files.

    a. List DEMO EXTR, then Repeat utility.
    b. List DEMO DELE, then Repeat utility.
    c. List DEMO RENU, then Repeat utility.
    d. List DEMO MERG, then Repeat utility.
    e. List DEMO REPL, then Quit.

13. Verify the program still works by loading and running DEMO REPL, and comparing the output to the original file:

```
A= 0
A= 1
A= 2
A= 3
A= 4
A= 5
A= 6
A= 7
A= 8
A= 9
COMPLETION OF TEST
```

6510+ HEADER CREATOR

GLENN DAVIES brings you a 6510+ Header File Creation Utility

The Header Create utility takes a symbol file from the 6510+ assembler (saved with SYMSAVE), and produces a file of EQUate statements which can be included in other programs. Incidentally, the name "Header Create" is taken from the language "C", which allows "header files" of "function prototypes" (the definition of a function and it's parameters) to be "included" into programs, so that the program which contains the "C" code for the functions does not have to be continually recompiled.

What is the point of doing this ? "Good" programming practice (at least according to the Dept. of Computation at the university I attend) requires the use of "structural decomposition". This nasty sounding term simply means that the program is broken down into component parts, each of which perform specific tasks. Those parts can then be made into modules - stand alone sections of code which can be included in other programs. 6510+ allows a simple form of module with the LIB statement. Writing your program as a series of modules not only makes the program easier to understand, but also prevents you having to "re-invent the wheel" all the time. For example, when you want a routine to display a hexadecimal number, you can simply include it as a LIB statement.

MODULES GALORE

When programs are written as a series of modules using the 6510+ assembler, these modules have to be re-assembled with each other if the symbols (also known as labels) are to be accessible to all modules. This presents two main problems. Firstly, re-assembling the modules, especially if you have a lot of them, can take quite some time. This length of time is so long because each module is read character by character. Even if you have a fast DOS built-in, there is no speed improvement. It may be possible to use the CHAIN command to speed things up, but this would require changing the source code of each module to link the next part (Also, I have experienced problems with this command). The second problem is that the long object file produced contains all the symbols from all the modules. Duplication of symbols means re-assembling the whole file again. Also, a large symbol table is produced, in which many symbols may be simply loops internal to a particular module.

THE ANSWER

Header Create provides a simple solution to these problems. It takes the symbol file from a module (or program), and converts them into a file of EQUate statements, which may be MERGED into another program, or accessed using LIB. This "header file" is much shorter than the complete source code for the module, and thus reduces the time taken to assemble the program.

A limited local symbol facility is provided by Header Create. Header Create can "mask out" symbols which conform to a particular pattern matching scheme, chosen by the user. For example, the user might choose to mask out all those symbols beginning with the letter "x", in which case the masking string is "x*". Modules can be written in such a way that all the symbols which are not required by other modules begin with a particular letter ("x" seems particularly good for this!). The Header Create utility can automatically remove these from the EQUates file it produces, leaving only those symbols required by other modules or programs. This shortens the symbol table that will be produced when you assemble the complete program, and reduces the risk of duplicated labels - and time consuming re-assembly.

USING HEADER CREATE

1) Write your program or module using the 6510+ assembler. If you wish to include the limited local symbol facility, choose a letter or string of characters which designate a symbol as being internal to the module. All the internal symbols should begin with this letter or string. For example, if the letter "x" is chosen:

"printstring" is a global symbol

"xprintstring" is an internal symbol

2) Assemble your module, and save the object file. Don't forget that when you run programs which use this module, you will need to load the object file, since the EQUates file consists only of symbols and hexadecimal values.

3)Save the symbol table using SYMSAVE. For example:

```
SYMSAVE “modulename.sym”
```

If you prefer, you can decide not to save this file, as Header Create can work just as well on the table in memory. In this case ignore the next step only, and load Header Create now (whilst 6510+ and your source file are still in memory) by typing:

```
LOAD “HEADER CREATE”,8
```

and typing RUN when this has loaded. Another file will load and the READY prompt will appear.

4) (If you have just loaded the utility into 6510+, go on to the next part and ignore this part). Reset your computer using the on/off switch or a reset switch if you have one. Action Replay users can use Fastload if they wish. Load Header Create by typing:

```
LOAD “HEADER CREATE”,8
```

and then typing RUN when this has loaded. Another file will load and the READY prompt will appear.

5) Start the utility by typing:

```
SYS 51200
```

or, if you are using Fastload, or are in 6510+, you can type:

```
SYS $C800
```

This is purely a matter of personal preference.

6) Type the name of the symbol file you saved earlier. If you did not save a file and have loaded Header Create into 6510+, simply press RETURN to indicate that the symbol file is already in memory. The symbol file will also be present in memory if you used a reset switch after assembling your module - you should test this on your system, however. The symbol file will load from disk. If a loading error occurs, the program will inform you, and you can try again.

7) Enter the masking string. This is the string which decides which symbols will be included in the header file. If you simply press RETURN at this point, all the symbols will be included. To exclude some symbols, type a string. When a symbol is encountered which matches this string, it will be left out of the header file. The masking string is similar in concept to the pattern matching facility of Commodore disk filenames. You can simply type the name of a single symbol (obviously, only one symbol will be ignored), or you can use pattern matching characters to make a “mask”. All the symbols which fit this “mask” will be ignored. The following examples should help to clarify this:

Mask	**Effect**
start	Ignores only the symbol “start”.
x*	Ignores all symbols beginning with “x”, regardless of what comes after the “*”. The “*” means “match with everything remaining”.
a?b	Ignores all symbols which begin with “a” and end with “b” and have a single character in-between. The “?” character means “this character automatically matches any other single character”.

8) Enter the first line number. The header file will look like a BASIC program, and so has line numbers. The use can choose where the line numbers begin. The line number is always incremented by 10. The user must make sure that there are enough line numbers remaining to fit in all the EQUates. A starting line number of 64000 is a pretty bad choice !

9) After a short pause, the utility will ask for the name of the header file which will be sent to disk. Type any valid filename. If the save is unsuccessful, the utility lets you try again. If you simply type RETURN, the utility will not save the file to disk and you will be returned to BASIC.

10) The header file just saved out to disk also exists in memory as a BASIC program and can be listed just like any other program. You can save further copies of this by typing:

```
SAVE “filename”,8
```

11) The Header Create utility still exists in memory and can be restarted by typing in one of the SYS statements listed previously. The original symbol table loaded also still exists in memory. To re-use this table, simply type RETURN when asked for the loading filename.

12) To use the header file just created you can either merge it into another 6510+ assembler program, or include it as a LIB statement in the program. Either way, be sure to place the file or it's LIB statement at the top of your program, or the program may not assemble properly. Don't forget to load the module object file when you want to run your new program

There is a simple example of the use of Header Create on the disk:

1) Load and run 6510+.

2) Load the file “PRIMM.SRC” from the CDU disk. This is the module we are going to use. The origin is set to $C100. You can relocate the code anywhere, but the example which follows assumes that the object code for

this module will be at $C100.

3) Assemble the module. There is no need to save the resultant object code, since this is already included on the CDU disk as "PRIMM.OBJ".

4) Save the symbol table to a spare disk by using SYMSAVE "PRIMM.SYM".

5) Load and run the Header Create utility.

6) Create the header file from "PRIMM.SYM". The masking string is x*. The save filename is "PRIMM.H". Save this file to the spare disk.

7) If you aren't in 6510+ already, load and run it again.

8) Load the file "TEST.SRC" from the CDU disk and assemble it. Note that the assembler asks for the disk containing "PRIMM.H" if you have not already inserted it.

9) Load the file "PRIMM.OBJ" from the CDU disk using the monitor (L "PRIMM.OBJ" 08).

10) We can now test the program by typing SYS START (return). The program should display a suitable message. The PRIMM module simply displays a string of characters terminated by a 0. For more details on usage, please examine the source listings.

This method of program development does take a little more thought, and there is certainly a little more messing about with disk files. However, I believe the results are worth the effort - who knows, after a while you may develop your own standard library of routines which you use in many different programs.

TECHNICAL DETAILS

The utility occupies the area from $C000 to $CC25. The actual utility starts at $C800. The rest of the program space is occupied by a series of standard i/o routines written by myself and included as a LIB file as described earlier. The maximum length of a symbol is 40 characters, although a symbol that is so long is highly unlikely. If you write programs with 40 character symbols, see a reputable psychiatrist now !

A note to Action Replay Fastload users: you can load the program from disk by pressing F3 to display the disk directory, placing the cursor over the filename and pressing F1, which will load and run the program. You will still need to use the SYS statement to start the utility.

Anyone who is interested in learning more about structured programming techniques may find the several books and articles by Michael Jackson (no, not that Michael Jackson !) useful. Most books on software engineering should include large sections on structured techniques, filled with dark warnings about what happens when you don't use them!

PRINTER GRAPHIC DESIGNER

User defined characters for your printer as shown by M.R.MEDHURST

This utility is for designing characters for bit image printing mode (chr$(8)). The characters can be up 7 dots high and 38 dots wide. The program is controlled by either a 1351 mouse or joystick in port #1 or the keyboard, keysleft arrow/ctrl/1/2 and space. It is very easy to use just by moving the pointer around the screen and clicking onto icons various menus will pop up.

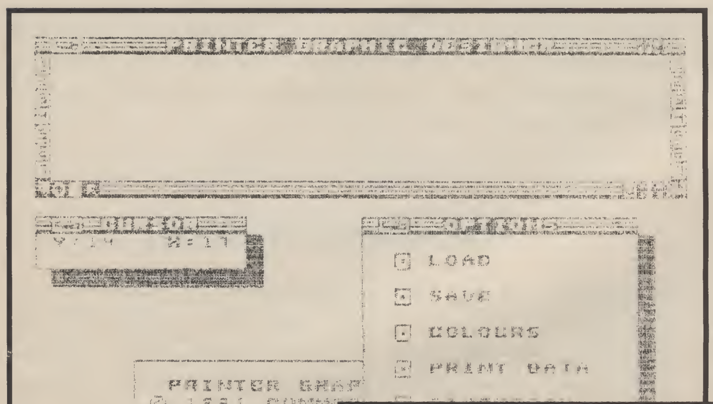
USING THE PROGRAM

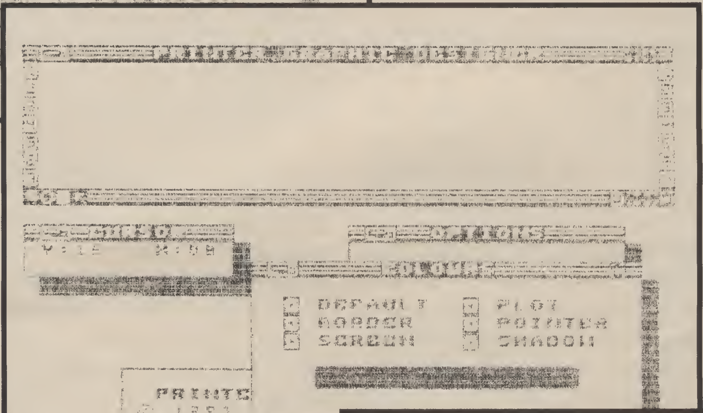
The overlapping rectangles bring up the options menu where you can;

LOAD a graphic already saved. (all graphics are prefixed with PGD. this is shown on the load/save menu and does not need to be type in). When loading images the usual wildcards can be used eg: * ?

SAVE a graphic that you have designed. Again all graphics are prefixed with PGD. So do not type this in.

COLOURS This option bring up the colour menu where the screen, border, plot

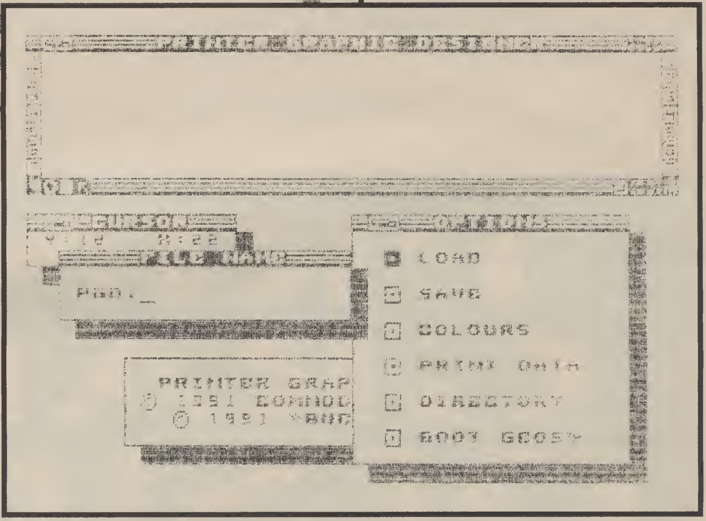




colours can be set, also the pointer on screen and its shadow can be set.

PRINT DATA The actual character is printed in bit image mode followed by data statements that can are used to make up the image.

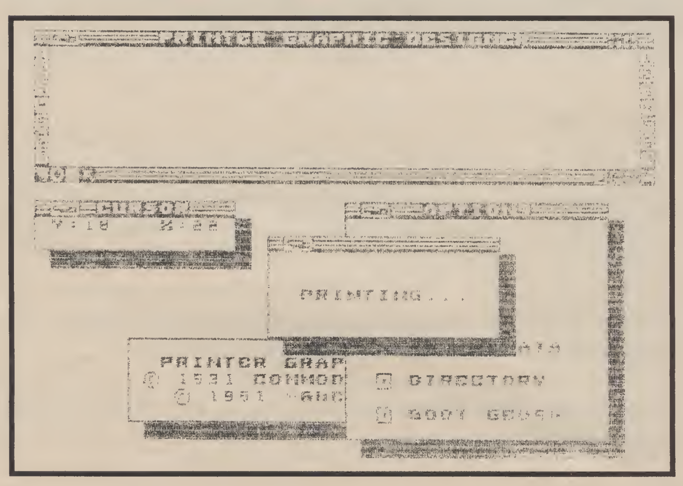
DIRECTORY This prints the disk directory to the screen, pressing any key after will return to the main screen.



BOOT GEOS Selecting this option will cause the program to try to boot GEOS from disk, a GEOS boot disk must be inserted or the program will display an error message giving you the choice to QUIT, TRY AGAIN or RETURN.

UP/DOWN ARROWS The up/down arrows at the top right of the screen are for scrolling the image up and down, this wraps around.

LEFT/RIGHT ARROWS as above by left and right., DUSTBIN The dustbin icon is to end the program after confirmation yes/no



UNDO The U or undo icon will undo the last command. NOTE: you cannot undo an undo command !

EXTRA NOTES

1) The inverted triangles icon in the lower left corner is for inverting the image ie: negative image

2) The filled circle next to it is the fill icon.

3) The blank square is the clear icon.

4) The pointer icon pops up a cursor position display to aid in positioning the pointer.

5) The data is used by first sending chr$(8) to the printer followed by the data printed by th program> for example

```
100 open 4,4 :            rem open a channel to the
                          printer
110 print#4,chr$(8):      rem switch to bit image
                          mode
120 for j=1 to 38:        rem set up a loop to read
                          the data
130 read d:               rem read data
140 print#4,chr$(d);:     rem print data to printer
                          don't miss out ;
150 next:                 rem loop
160 print#4,chr$(15):     rem switch off bit image
mode
170 close 4:              rem close channel to printer
200 data 128,etc,etc, ......
```

GEOPOUND

J. O'DONNEL brings you another GEOS utility that will be greatly accepted - it enables you to convert GEOS printer drivers to print the POUND SIGN

For many years GEOS users throughout Britain have been unable to print a Pound sign, particularly when using NLQ. For some unknown reason, the creators of GEOS deemed it necessary to reject that character during a keyboard scan. Maybe CHR$(92) is reserved by the GEOS operating system, I don't know.

Many users have got around the problem with a bit of judicious flicking of DIP switches. But if your printer is like mine that won't help. I have an EPSON GX-80, which is only marginally more flexible than an MPS-801. The answer for me is in the software, a wedge into the printer driver to be more precise.

THE PROGRAM

GEOPOUND will give your printer driver the ability to print Pounds (I wish!). This is based on the assumption that under normal circumstances, outside GEOS, your printer will translate CHR$(92) into a British Pound.

To do this you must follow a few simple steps, but first let me make one important point. The conversion process must be carried out on a spare disk as it involves direct access of the disk and WILL corrupt the BAM. DO USE A SPARE DISK.

Step 1. Boot GEOS to the Desktop.
Step 2. Take a spare disk and format it.
Step 3. Copy your printer driver onto the blank disk.
Step 4. Quit GEOS.
Step 5. Load GEOPOUND.

Type LOAD"GEOPOUND",8 <RETURN>. When the load is complete type RUN <RETURN>. The screen offers two options, Convert and Directory. The Directory is there for your peace of mind, you can check which disk is in the drive. Convert does the work.

Step 6. Press C to begin the process.
Step 7. Enter the name of your printer driver.
Step 8. Put spare disk in the drive and press a key.

That takes care of the conversion. When the menu re-appears the job is done. Check the directory and you will see your printer driver with " UK" appended to the filename. Now copy this file onto your Geowrite work disk.

A LITTLE REMINDER

Let me remind you about GEOS and printer drivers. When first booted, GEOS takes the first printer driver in the directory as the default driver. This is the driver that appears at the foot of the desktop. When you attempt to print a file from within Geowrite, GEOS looks for that driver on your work disk. If it can't be found then the printing is aborted. This means that if the driver on your boot disk is MPS-801 and the driver on your work disk is MPS-801 UK then it won't work. Both filenames must match. The suffix " UK" is for user recognition only. Once copied to the work disk, rename the new driver to match the original and your in business.

To enable you to differentiate between the old and new drivers, I would advise you to make a comment in the INFO box accessed via the Desktop.

But all this doesn't bring the Pound key to life! So we don't use the Pound key, we use the # or hash as it is known. To facilitate this, a new font is included on the disk, this is called CBM UK. Use CBM UK in place of the COMMODORE font normally used for NLQ. To get a "POUND" press "#" and if you are using CBM UK a POUND will appear on screen. The new printer driver can also be used with GEOCALC but I'm afraid you will have to settle for the # on screen.

What did GEOPOUND do to your driver? Well in order to get a pound out you must put a pound in. This is achieved by inserting a wedge into the driver to trap all #'s and replace them with pounds's

GEOS printer drivers load into memory at $7900. Armed with this information we can set a program counter (PC) to load the driver in. When the load is complete the end address of the program is in the PC. Increment the counter and we have the start address of our wedge.

TECHNO BITS

A disassembly of a printer driver reveals that all output is made via $FFA8. This is the Kernal ROM routine that outputs a byte to the serial bus. Load the accumulator with the character and then JSR $FFA8. If we scan memory from $7900 to the address in our PC, for all occurrences of $A8 $FF and replace them with the address in our PC then the wedge is made. Now install the trap and save the whole lot back to disk

The trap is a simple comparison routine.

```
CMP #$23            ; is it a #
BNE output          ; if not go to output
LDA #$5C            ; get a pound
output JMP $FFA8    ; output to printer
```

The loading and saving of the USR file is carried out by the DOS using the structure of a sequential file. But there is one block missing here, the sidesector carrying the icon and file information. Using direct access techniques, the link to this block is re-established and the original file removed from the directory. This works fine, but it doesn't update the BAM and this is why a spare disk should be used.

COMPUTE AIDED ST

All that glitters is not Gold - All home computers are not just toys - PAUL TRAYNOR

Regardless of what your subject is I guarantee there will always be a part which your computer can play in aiding your study. The aim of this article is to prove this fact. The computers usefulness will of course be different in each case. The computer can be used directly for study e.g. as when preparing and producing written work or indirectly, just as an aid e.g. for collating facts and figures for reference. Together with the article are 2 programs, each has 2 versions for the 64 and 128.

USING EXISTING GENERAL PURPOSE SOFTWARE

By general purpose I mean WORD PROCESSORS, DATABASES, SPREADSHEETS and ART PACKAGES. The kind of software that most users will already own in one form or another.

A WORD PROCESSOR or DESK TOP PUBLISHING program will be useful for students of any subject from ATOMIC PHYSICS to MATHEMATICS and NUMEROLOGY to ZOOLOGY for writing reports, thesis, essays or for preparing neat reference notes or revision sheets. As well as this direct use, word processors can also be useful as general aid to spelling and word meanings if they include a spell checker or thesaurus.

The use of a computer equipped with a spreadsheet calculator program will be ideal for studying mathematical based subjects. It is possible to produce easy to follow and understand breakdowns of complicated mathematical formula such as, the calculations for quadratic equations and trigonometry formulae. Another good use for a spreadsheet is for creating historical charts e.g. monarchy family trees, this is brought about by a spreadsheets ability to produce a large sized document compiling of several normal A4 sheets side by side and therefore over coming the width limitation of a word processor or desk top publisher. Another use for spreadsheet programs which is not actual studying but it is connected, is keeping a record of marks for tests, examinations and general work. You can calculate average percentages and monitor your progress and hopefully improvements in your results.

THE LIST GOES ON

Databases could possibly be the most versatile software packages for use by the student. Following are just a few examples of databases which can be created and utilised for specific topics of study.
For maths students we could have mathematical formulae put in a database along with fields for uses and brief explanations this could lead to searches for all the trigonometrical formulae or all the statistical formulae. Scientific subjects (physics, chemistry and biology) give us a whole host of different types of information which could be useful when held as a database. Examples from these subjects could include a database of the chemical elements. Fields in this database could have titles such as name, number, symbol, atomic weight. A good example of a database for physics would be one of physics laws, where fields would be name of law, name of originator, specific topic that law refers to and most importantly actual text of the law. Another example from the scientific subjects is metals or any materials with fields holding the information such as mechanical and biological properties and composition. If your subject is Geography a databases function can include storing of information such as population size, national products, resources, language, currency of different countries of the world. For local geography; populations, sizes and industries of different towns could make up your database. If you are studying foreign languages you may find a database of some use for translations, meanings

R
UDY

and verb conjugation, this means, of course, those different forms of every foreign verb that you have to learn (e.g. I go, you go, they go, she goes - looks so much easier in English). This subject, foreign languages may be more suited to a purpose built program because of the added complications of extra letters which would need to be incorporated (e.g. the German umlaut symbol).

Entering all of this information may seem to be wasted effort but the fact that you are reading and then typing will aid your ability to remember and recall the information. You must not find yourself entering every bit of information, which you have learnt, on a database because this would be wasted time and effort but you have to be careful in selection.

An art package will probably be of little use to an artist who wants to be an expert in the use of pencils or paints. But it can still be a useful tool for the creation or collating of notes, which can not be easily produced on text-based software. Examples include foreign languages with non-standard letters, these are easily reproduced with the versatility or an art package. The examples mentioned in the spreadsheet section can also apply for graphics packages, indeed a family tree of English monarchs produced with an art package would look better than one produced on a spreadsheet. Religious family trees starting from Adam and Eve are another example, for students of Religious studies. Although not recommended for learning to create art it can be useful, together with a hand scanner (for those lucky enough to own one) for storing your sketches. For students of chemistry an art package would produce a good Table of elements or some representations of Hydro-carbon structures for example. An art package or even a Desk Top Publisher is useful for any collating of notes which are better explained with a sketch or diagram for reference.

An art package together with some clip-art pictures of animals can be very beneficial for early learning. In fact youngsters could well be the user's who benefit most from a computer and it's ability to aid the learning and teaching processes. Youngsters are lucky because there are a number of purpose built commercial programs to aid there learning capacity. Creating programs for this purpose yourself can be very easy, the programs can be as simple as counting the correct number of teddy bear shaped sprites on the screen or adding up the correct number of circles or squares drawn on screen or spelling correctly the name of a picture of an animal which could have been imported, as mentioned before, from a clip art collection.

EVEN YOUNGER EDUCATION

For the early learning section the use of a computer can do very little wrong. Its role is increasingly more important. But for school age and post school education a fine balance has to be obtained between the use of your computer (ie creating your factual database, etc.) and ordinary non-electronic methods of study. By this, I wish to emphasise that it all to easy to spend too much time on the computer trying to create an efficient learning system at the expense of actually knuckling down and doing the study, you may create the best system in the world with all of the notes for your studies held in purpose designed databases only to find you have run out of time for study and the exams are upon you. As said already it is a matter of attaining a balance. The right balance can give very successful results the wrong one can be a disaster (ie. a student may be find he/she has only learned how to use his computer and nothing else) Do not let a warning like this frighten you off though.

ONTO THE DEMOS

A sure fire way of using your computer as an efficient tool for study is the use of purpose built software. an example of this is the Misspeller program, 2 versions of which accompany this article. The other program accompanying the article is THOUGHT COLLECTOR or TC. Both programs instructions are detailed later in the article.

Other available programs include language aids like the ILS program, for the C128, in December 1990 issue of CDU. One area which has had a number of commercially available programs, as already mentioned, is 'Early Learning' for our younger users.

If you cannot find suitable learning aids and you needs are greater than that offered by general purpose programs then one solution is to write your own. A database which allows character set alterations for foreign language, or a calculator program which plots graphs as thorough descriptions of answers or allows the entry of algebraic expressions which gives solutions or one which allows trigonometrical entries on drawings of triangles and other shapes and then calculates unknowns. In chemistry we could have a program which holds chemical symbolic information about a whole range of elements, mixtures and compounds and could be used to predict possible results to chemical experiments. In another scientific

subject, Physics, the idea of calculating programs and showing graphical or picturesque representations of answers could be very useful as with the mathematical examples.
Another dimension which you can add to programs which you create yourself is after the entering of information you can have a test mode. Checking on your progress and this can be further expanded by including timed tests.

MISSPELLER 64 & 128

MISSPELLER is program which is designed to help the user improve his or her spelling, Working on lists of 20 words at a time you test yourself by picking the correct spelling from 3 different alternatives. MISSPELLER also has the capacity to store lists for future recall and testing as well as the option to produce a hardcopy of your lists. Two example files are included called "TEST1" and "TEST2".

RUNNING THE PROGRAM

There are two versions of the MISSPELLER program, one for the C64 and one for the C128. The C128 version works in 80 column mode. Both programs do the same job but the 128 version is shorter because it can take advantage of the 128's advanced BASIC version 7.

For the C64 Type;
LOAD "C64 MISSPELLER",8 {Return}
followed by RUN {Return}

For the C128 Type;
RUN "C128 MISSPELLER" {Return}

You will then be presented with the initial menu which has five options.

1) Input new words
2) Disk options
3) Print words
4) Begin spelling test
5) Quit program

INPUTTING NEW WORDS

Select 1 to enter a list of twenty new words. If a list of words is already present in memory then you will be asked if you are sure that you wish to enter another list, which will mean the present list will be lost from memory. You will be shown the number of each word as you enter it and all the words will collect in a list when entered. The only keys which are available for use whilst entering the words are the letter keys and the delete key. Words lengths are restricted to a minimum of 4 letters and a maximum of 15 letters, press return to enter each word. After all twenty words have been successfully entered, hit any key as requested and you will be returned to the main menu.

DISK OPTIONS

Selecting 2 from the main menu will take to the Disk options menu. This menu has five options as below;

1) Load words
2) Save words
3) Directory
4) Device No.
5) Main Menu

LOADING WORDS

This option is to enable to re-load lists of words which have been previously saved. You can repeatedly test yourself until you are a confident speller. Enter 1 at the Disk options menu and you will be prompted to enter the filename, you should not include the prefix "MS." which will be added automatically by the program. After loading you will be returned to the main menu.

SAVING WORDS

When you entered and tested yourself on a set of words you can save them to disk. Just enter 2 and then the filename you wish to use, as with loading the prefix is not required. After saving you will be returned to main menu.

DIRECTORY

Selecting 3 from the disk options menu will present you with a directory of all the sequential files prefixed by "MS." i.e. all the lists of words that have been saved.

DEVICE NO.

Option 4 allows you to utilise more drives if you own them device numbers from 8 - 11 are allowed. The number entered here will then be used by all loading saving and calling up of directories.

MAIN MENU

Option 5 will exit the Disk options menu and return you to the main menu.

PRINT WORDS

Option 3 from the main menu will allow the user to print a list of the words that are presently in memory on to a Commodore compatible printer.

BEGIN SPELLING TEST

To begin your test select option 4 from the main menu. You will be asked if you are sure, a positive reply will lead on to the test. For each word you are simply presented with 3 slightly differing alternatives and you should select the number of the one you consider to be correct, by pressing 1 2 or 3. You will immediately be told if it is correct or incorrect, then hit any key to continue. When you have worked your way through the 20 words you will be shown your score out of twenty. Pressing any key after this will return you to the main menu.

QUIT PROGRAM

Option 5 from the main menu will allow you to quit the program. You will be asked if you are sure, just answer Y or N.

THOUGHT COLLECTOR

Thought Collector is a program which is designed to help the user collect notes together, it is suitable for any subject. You work with 3 levels of ideas these are Main Topic, sub-topics and information. Thought Collector also has the capacity to store your notes for future recall and as well as the option to produce a hardcopy for reference. An example file is included called "TEST"

RUNNING THE PROGRAM

There are two versions of the Thought Collector program, one for the C64 and one for the C128. The C128 version works in 80 column mode, But both programs do the same job.
For the C64 Type;
LOAD "64TC",8 {Return}
followed by RUN {Return}

For the C128 Type;
RUN "128TC" {Return}

You will then be presented with the initial menu which has five options.

1) Input new Topic
2) Disk options
3) Print words
4) View and Edit
5) Quit program

INPUTTING A NEW TOPIC

After selecting 1 from the main menu you will be asked to enter your Topic title, then press return. You will then be asked to enter up to 20 sub-topics, press return after each one. If you do not wish to enter every one of the twenty then just press return at the request. After entering sub-topic number twenty, hit any key to return to the main menu. If there is already a topic in memory when first selecting option 1 you will be asked if you are sure you wish to proceed, because the present topic will be wiped from memory.

DISK OPTIONS

Selecting 2 from the main menu will take to the Disk options menu. This menu has five options as below;

1) Load new topic
2) Save topic
3) Directory
4) Device No.
5) Main Menu

LOADING TOPIC

This option is to enable to re-load Topics which have been previously saved. Enter 1 and you will be prompted to enter the filename, you should not include the prefix "TC." which will be added automatically by the program. After loading you will be returned to the main menu.

SAVING TOPIC

Enter 2 and then the filename, you wish to use, as with loading the prefix is not required. After saving you will be returned to main menu.

DIRECTORY

Selecting 3 from the disk options menu will present you with a directory of all the sequential files prefixed by "TC." i.e. all the Topics you have saved.

DEVICE NO.

Option 4 allows you to utilise more drives if you own them device numbers from 8 - 11 are allowed. The number entered here will then be used by all loading, saving and calling up of directories.

MAIN MENU

Option 5 will exit from the Disk options menu and return you to the main menu.

PRINT WORDS

Option 3 from the main menu will allow the user to print a list of your notes that are presently in memory on to a Commodore compatible printer.

VIEW AND EDIT

When you select 4 from the main menu you will first be presented with a list of the twenty sub-topics, Enter 1-20, and press return, to view the details contained in each of these. These sub-topic lists also contain twenty locations, enter 1-20 to enter or change information. At each of these prompts just pressing return with no number will return you to the previous screen. Each of the twenty locations within each sub-topic can be entered and changed at will.

QUIT PROGRAM

Option 5 from the main menu will allow you to quit the program. You will be asked if you are sure, just answer Y or N.

STUDYING TIPS

To finish off I would just like to outline a few general studying tips.
Firstly it is incredibly important to have a genuine interest in the subject you are learning. It is not very helpful if you do not like the subject which you are studying. This article should help with this first comment, because you are doing something which you like, computing, to aid your studying.
Secondly planning all of your studying and revision time is important to make sure that you cover all of the subject matter in time for your exams remembering to leave time at the end for revision.

Finally prepare yourself mentally before any exam, it is important to be in the correct frame of mind, ie you should not be tired but you should be happy, actual smiling during your exam may not improve your results but it may distract others and hence lower the class average making your results look better.

NOW IS THE TIME TO CATCH UP ON ISSUES YOU HAVE MISSED

The following back issues of CDU are still available direct from ALPHAVITE PUBLICATIONS LTD. Please note that if ordering one of the following back issues, you will receive a copy of the disk, along with photostat copies of instructions for the relevant disk programs ONLY. These back issues cost £4.50 each which includes Post/Packing. Please make cheques/Postal Orders out to:- ALPHAVITE PUBLICATIONS LTD (Allow 28 days for delivery).

VOL 1 No.1 NOV/DEC '87

DIRECTORY DESIGNER - Tidy up your disks with this Editor/Designer.
TEXT ENHANCER - Improve your text displays.
MOBSTER - Have you got what it takes to be a gangster.
3 INTO 1 PLUS - A superb Character, Sprite and Background Editor.
SKI RUN - All the thrills of the slopes with this game.
SPRITE PRINTER - Dump your favourite sprites onto your CBM printer.

VOL 1 No.2 JAN/FEB '88

DISK LIBRARIAN - Keep track of what's on what disk.
DISK MATE - Handy pop-up disk functions.
NOLUXE PAINT - A superb low-res drawing package.
TEXT CRACKER - Grab those character sets you like for your own use.
QUAD - New life for the brick/bat game.
FIVE-UP - Can you win at this dice game?
RAM DISK C128 - Our first program for the C128.

VOL 1 No.3 MAR/APR '88

SUPER-TACT - Tactics are the essence of this game.
CHAOS IN SPACE - A shoot-em-up that's deceptively different.
C-ZAP - Speed is the name of the game with this compiler.
BASIC+ - A comprehensive Basic extension.
TAPE ARCHIVE - Be safe and back up your disks.
LINK & CRUNCH - Running out of memory/disk space? Not anymore.
PSYMON - A full-facility machine code monitor.
DISK LIBRARIAN II - An updated version of DL.
C128 AUTOBOOT - For C128 owners - load C64 progs at C128 speed.

VOL 1 No.4 MAY/JUN '88

DRUMSYNTH - Percussive programming.
C128 PULL DOWN WINDOWS - Windowing for the C128.
TOKENISER - Word-process your Basic programs.
C-CAD - Enter the world of Computer-Aided-Design.
BASIC COMPACTOR - Squeeze up your Basic programs.
SANTOLUS - A demanding smooth-scrolling maze.
ATLANTIS - Explore the lost continent.

VOL 1 No.5 JUL/AUG '88

DISK TOOLKIT - The Editors very own comprehensive utility for disk users.
RELOCATOR - How to move your machine code.
MIND GAMES - Unscramble the Presidents brain.
3-D BREAKOUT - Bash those bricks in 3 dimensions.
PEGGY 128 - An amusement for C128 owners.
ORRERY - Planetary positions computed.
MESSAGE CONSTRUCTION KIT - Full-screen scrolling messages.

VOL 1 No.6 SEP/OCT '88

SCORPION - If it moves, kill it.
COLOUR MATCH - Tailor your 64 screen colours to your own taste.
C128 SPREADSHEET - Accounts can be simple.
ESCAPE - Can you find a way to escape the Nazis?
STARBURST - Your chance to save the galaxy.
SCORE KEEPER - Using Sprites for your game scores.
ADDIT - A tactical numbers game.
LOCATION FINDER - Find out what that bit of code's up to.
FRACTAL FROLICS - Fun with the Mandelbrot set.

VOL 2 No.1 NOV/DEC '88

CDU FORTH - Escape from Basic with our compiler.
TEXTED - Word-processing made easy.
EXTRACTOR - Build up your sprite library.
WINDOWS 64 - Generate windows painlessly.
ZMON - Program your C28's Z80 chip.
CRIBBAGE MASTER - A C64 first, this program plays a mean game.
OBLIVION! - Fight off the deadly Janoids.

VOL 2 NO.2 JAN/FEB '89

DISK TURBO - Speed up your disk access.
BLASTBALL - A bat 'n ball extravaganza.
COLOUR BIND - A sliding block problem with a difference.

BORDER SPRITE - Make use of those screen edges.
DATA MAKER - The easy way to get machine code into Basic.
LIFE - The bizarre world of cellular automata.
MENU MAKER 128 - Make your 128 disks easy to use.
MICRODOT - Save the world from radiation sickness. (Superb game)
SPOTS - Can you beat the machine's dice rolls?
EASY SCROLLER - Scrolling made simple.
RUNAWAY - Can you escape from a dreary domestic existence?
LOGIC - The puzzle that will have you tearing your hair out.

VOL 2 No.3 MAR/APR '89

DARTS - Pub fun - in the comfort of your own home.
CDU PAINT - The ultimate C64 graphics package.
DEVAID - The Editors very own extended Basic with 41 new commands.
BAZAIR - Can you survive the maze of death?
ARAKNIFOE - Get your own back on those creepy-crawlies.
C128 GRAPHICS PRIMER - Make use of those 80 columns.
DOMINOES - Pit your wits against Max and Joe.
PHANTOM - Strike a blow for world revolution.

VOL 2 No.4 MAY/JUN '89

BASE ED - Get organised with this C64 database.
DBASE 128 - 40 or 80 column storage for C128 owners.
6510+ - The ultimate in C64 assemblers.
SID SEQUENCER - Make commodore music with ease.
LIBERTE - Escape the POW camp in this 1940's style adventure.
FX KIT - Bangs, Pows and Zaps made easy.

VOL 2 No.5 JUL/AUG '89

FONT FACTORY - Create your own characters.
HIRES DEMO KIT - Add music to your favourite picture.
ANIMATOR - Get those sprites moving
BORDER MESSAGE SCROLL - Say what you like along the bottom of the screen.
TYPIT-128 - Create professional text layout on your C128
SCREEN COPIES UTILITY - Download your favourite screens, including CDU paint files.
VIDI-BASIC - Graphic based extension to Basic.
64 NEWS DESK - Become a C64 reporter.

VOL 2 No.6 SEP/OCT '89

MICKMON - An extensive M/C monitor.
SCRAPBOOK - Collectors and hobbyists database.
CELLRATOR - Enter the caves if you dare.
RAINBOW CHASER - Rainbows means points in this unusual game.
HIDDEN GRAPHICS - Utilise those graphic screens.
FORTRESS - Save the world! Yet again.
DISK HUNTER - Keep tabs on your disk library.
SUPERFILE - One more for the record keepers.

VOL 3 No.1 NOV '89

BASIC EXTENSION - Windows and Icons the easy way.
B-RAID - Vertical scrolling shoot'em up.
DISKONOMISER - Prudent disk block saving.
HELP - Design your own information help screens.
ORSITAL - An arcade style game with a difference.
PROGRAM COMPARE - Basic program development has never been easier.
RASTER ROUTINES - A few colourful demos.
SPRITE EDITOR 1 - A no nonesense basic sprite editor.
WABBIT - Help the rabbit collect his carrots.

VOL 3 No.2 DEC '89

KRON - Can you meet the challenge?
CDU MENU KIT - Design your own menus with ease.
PHOBOS - Break out of jail and gain your freedom.
LIMBO - Collect the cells off the blocks.
MUSIBASIC - Sound and music made easy.
PANIC - Is your eye as quick as your joystick.
TEMPLATE DESIGN - Backgrounds the easy way.
QUIKWORD - You very own expandable word processor.

VOL 3 No.3 JAN '90

4 IN A ROW - Connect a row of counter.
FROGS IN SPACE - Leap to safety across the space lanes.
BLACKJACK - Don't loose your shirt.
LORD OF DARKNESS - Defeat the evil lord in true adventure style.
MARGO - Fly around and collect jewels and fuel.
JETRACE 2000 - Have you got what it takes to be best?
ULTIMATE FONT EDITOR - Create your own screens, layouts and characters.
SELECTIVE COLOUR RESTORER - Design your own system start up colours.
6510+ UNASSEMBLER - Transform 6510+ M/C into source with labels.
TRIVIA CHALLENGE - The first of 3 files for this superb game.

VOL 3 No.4 FEB '90

COLOUR PICTURE PRINT - Download your favourite colour screens.
BASE-ED2 - An update to our popular database system.
1ST MILLION - Play the market in this strategy game.
FM-DOS - Enhance your drives operating system.
GEOS FONTS - A further 4 fonts for Geos users.
HASHING IT - Reletive file programming made easy.
MULTI-SPRITE - Make full use of up to 24 sprites.
DIRECTORIES EXPLAINED - Find your way round the directory jungle.
TRIVIA CHALLENGE - The 2nd part.

VOL 3 No.5 MAR '90

PLAGUE - Become your planets Guardian and Defender.

SURROUND - Reversi on the C64
GEOS FONTS - The last of 12 new Geos fonts.
SCREEN SLIDE - Create your own slideshows.
JOYSTICK TESTER - Put your stick(s) through the mill.
COLOUR MATCHER - Mastermind for the younger players.
SCREEN MANIPULATOR - Full use of the screen now obtainable.
VIDEO RECORD PLANNER - Keep tab on your home recordings.
TRIVIA CHALLENGE - The 3rd and final part of the game.

VOL 3 No.6 APR '90

BAR PROMPTS - M/C input routine.
HI-LITE BARS - Input routine but in Basic.
TEXAS DEMO - Example of using Basic in demos.
CHARS TO SPRITES - Convert UDG's to sprites.
FONT FACTORY - Complimentary program to the above.
3D-TEXT MACHINE - Impressive 3D text screens the easy way.
SCREEN ENHANCER - Makes full use of the screen easy to achieve.
SPREADSHEET 64 - An excellent, easy to use spreadsheet.
MINI-AID - 3 short utilities to aid the Basic programmer.
C128 COLLECTION - 3 very useful C128 programs.

VOL 3 No.7 MAY '90

NUDGE - FLD explained in laymans terms.
WINDOW WIPER - An alternative screen wipe system.
CHARACTER EXTRACTOR - Borrow those nice character sets you see.
MAZE GENERATOR - Create your own fun.
HIRES ANIMATOR - This difficult subject made easier.
SPRITE DRIVER - Platform game designing without the fuss.
ROTOTRON - Demonstration of Sprites and Sound.
TEXT COMPRESSION - How to squeeze a gallon into a pint.
SCREENS - Make up your own help screens and keep them in memory.
INTERRUPT POINTERS - Geos style windows and pointers for you.

VOL 3 No.8 JUN '90

ALEATORY MUSIC - An alternative music system.
SPRITE BASIC - Efficient sprite handling through Basic.
SPRITE GENERATOR - Another sprite editor for your library.
MUNCHER - Pacman returns with a vengeance.
ASTRODUS - Escape the spaceship Astrodus in this adventure.
1581 DIRECT ACCESS - Find your way around the 1581 disk drive.
PERSONAL ORGANISER - Design your own organiser pages.
128 CONVERTOR and MATHS AID - 2 more for C128 users.

VOL 3 No.9 JUL '90

QUICK MERGE 64/128 - Another useful routine for your archives.
THE GAME PLAN - An aid to knowing what where in your games.
CHARACTER DESIGNER - Another designer for those without.
HASHBASE 128 - A powerful database for C128 users.
REVASM 64/128 - Two unassemblers for non Speedy Assembler owners.
SPEEDY UNASSEMBLER - An unassembler specific to Speedy Assembler users.
BANKS AND MEMORY - An aid to redifining screen and graphic memory.
GRAPHICS FACTORY - A novel way of getting in graphic design.
POT POURRI - A selection of useful routines for all users.

VOL 3 No.10 AUG '90

LIMBO 2 - The sequel to Limbo
SCREEN DESIGNER 128 - Screen designing made easy.
DATABASE78 - A database full of features.
LETTER MAKER - Text Screens made decidedly pleasing.
FUNCTIONS - Make full use of those function keys.
GAMES LIST CREATOR - Keep tabs on your games disks.
DUAL DISKCOPY - At last an intelligent disk copy program.
SEQUENCER64 - Musicians have a field day.
SECURITY - Put all those broken joysticks to good use.
SUPERBOOT! - Auto load your programs.

VOL 3 No.11 SEP '90

BANKING 128 - A simple way of keeping your money straight.
DISK DRIVER V4 - A simple disk utility.
AUTOBOOT 128 - C128 users get easy access to CDU programs.
READING BETWEEN THE LINES - Build your own adventure parser.
I.D.O.S. - A comprehensive drive utility.
PRICE CALCULATOR - Keep tabs on inflation.
B.O.S.S. - Yet another alternative to the standard Basic.
SCREEN DESIGNER/COMPILER - Impressive screen layouts for all.
LANDSCAPE ROUTINE - Beginners guide to scrolling backdrops.
SAMPLE KIT 64 - More sampling for all you musicians.

VOL 3 No.12 OCT '90

ROLL'EM - An example of using Graphics Factory.
COLOUR MATCH - A short utility for C128 users.
SPREAD-ED - The third in the 'ED series.
RASTER EDITOR - Put those raster lessons to good use.
ADDRESS BOOK - A somewhat unusual address base.
SUPERSORT 64/128 - Sorts have never been easier.
SPRITE EDITOR C128 - Another utility for C128 users.
GRAPH-ED - The last in the 'ED series.
BACKGAMMON - That popular board game gets an airing.

VOL 4 No.4 FEB '91

CRANMORE DIAMOND - Another Tony Rome adventure.
COMPACTOR - Program protection made easy.
ADVISOR - Artificial intelligence on the 64.
GALACTIC ENCOUNTER - Battleships played out in space.
IRQ64 - Interrupts on the C64 explained.
2 FOR THE C128 - Check your 128's RAM and PLAY command.
CHEQUE BOOK ORGANISER - Organise your cheque books and statements.

The following back issues can be obtained from **Select Subscriptions Ltd, River Park Estate, Berkhamsted, Herts, HP4 1HL.** These back issues cost £3.75 each which includes Post/packing. Please make cheques/postal orders out to:- **SELECT SUBSCRIPTIONS LTD** (Allow 28 days for delivery).

VOL 4 No.1 NOV '90

WAR AT SEA - C128 version of battleships.
FULL DISK JACKET - Keep track of your disks.
NEAGOX - Blast everything that moves.
NUMDEF - A basic game to test the reflexes.
MEMORY SCANNER - Look through memory the easy way.
MONEY 64 - Budget planning for the 90's.
XINOUT - An alternative input routine.
CALENDAR C128 - No more buying of calendars.
GOMOKU - An interesting variation of 'GO'.
SMOOTH SCROLL DEMO - Create your own scrolls.

VOL 4 No.2 DEC '90

ILS (German Program) - A C128 language tutorial.
SCREEN DESIGN CORRECTION - An update to this excellent utility.
BETTER BACKUPS - Help for ARC users.
MACHINE CODE GEMS - A suite of MC routines to aid you.
COLOUR TABLE EDITOR - Get those raster bars right.
MULTITASKING C128 - An implementation for the C128.

VOL 4 No.3 JAN '91

2X2 CHARACTER EDITOR - Design large fonts easily.
ENCRYPTION - Password and program protection.
SECURE - Another against would be hackers.
KA43/5 OPEN SYSTEM - Expand the C64's op system.
32 SPRITES - The world of sprites opened up.
DISPLAY.ASM - Multitasking source file displayer.
TERMINUS - A demo that is somewhat unusual.

VOL 4 No.5 MAR '91

SPRITE MASKER - Another useful sprite utility.
SEUCK EXTENSION KIT - Make full use of the SEUCK utility.
INTRO LINKER - Create professional looking intro screens.
SEUCK WITH MUSIC - Add music to your SEUCK creations.
AUTO MENU - A menu maker program with a difference.
SOLITAIRE C128 - A very good board game conversion.
ZAKRON - Breakout that's decidedly different
AMIGA DEMO SCREEN - A demo of what an Amiga looks like.

VOL 4 No.6 APR '91

CHAR ED DELUXE - A professional character designer.
RESCUE - One for the shoot'em up addicts.
SCREENS V2 - An updated version of an earlier program.
MULTIPLEXOR - Get those sprites zapping around the screen.
HIRES CONVERTOR - Convert your characters with ease.
SCREEN DESIGNER/COMPILER 2 - Yet another updated program.
COLOUR TABLE EDITOR - The correct version of this superb utility.
6510= ASSEMBLER - Reproduced to compliment the new series.

VOL 4 No.7 MAY '91

DISK DOCTOR - A useful utility for drive users.
MANAGING STOCKS - A stocks management program for C128 users.
DISK SLEEVE PRINT - Another sleeve printer for normal printers.
RASTER MASTER - Yet another raster utility for graphic freaks.
64-TEL - Transform your C64 into a Teletext service.
WORDSEARCH - A puzzle compilers dream come true.
BUSIBASIC - Business programmers get a helping hand.
TURBO LOADER - Fast load all your favourite programs.

VOL 4 No.8 JUN'91

COUNTDOWN - Watch those blocks disappear whilst loading.
POWER TOOLS - A suite of 6 programs for the serious programs.
I.D.O.S. V2 - Our interactive disk operating system - updated.
FRANTIC - Blast everything that moves in this shoot'em up.
MONSTERS - Buy, Sell and do Battle with your own monsters.

VOL 4 No.9 JUL'91

EUROPEAN - Your own C64 language tutor.
SCHIZO - A somewhat unusual and mind bending game.
MADDIX - A stimulating arcade/strategy game.
LOGO EDITOR - Create your own logo's with ease.
LETTER WRITER V2 - Compliments LOGO EDITOR.
MEMORY TRANSFER - A simple code transfer program for Basic users.
ESP SYNTH VERSION 1 - The Editors freebee (Thanks for your support).
ELVIRA DEMO - A playable demo of this great Amiga game.

VOL 4 No.10 AUG'91

FILE UTILITIES - A collection of Basic programming tools.
GAMES LIST CREATOR V2 - Another updated program.
ULTIMATE DATA MAKER - Data statements made the easy way.
LABELLER 64 - Create your own labels with ease.
MEMORY GAME - A computer version of concentration.
LITE MENUS - An easy way for Basic programmers to produce menus.
BASIC MAKER - Basic programs produced on a Word Processor.
WINDOWS C64 - Windowing made easy.
X-RAY FILES - Examine your files in more detail.
PANAL C64 - A comprehensive analyser utility for Basic users.

Commodore ·DISK·USER·

Lineage: 58p per word. (+VAT)
Semi display: £11.50 plus VAT per single column centimetre minimum 2cm. Ring for information on series bookings/discounts.

All advertisements in this section must be prepaid.
Advertisements are accepted subject to the terms and conditions printed on the advertisement rate card (available on request).

0908 569819

Send your requirements to:
CDU CLASSIFIED DEPARTMENT, ALPHAVITE PUBLICATIONS LTD.,
20 POTTERS LANE, KILN FARM, MILTON KEYNES, MK11 3HF.

PUBLIC DOMAIN SOFTWARE

for the C64/128.
We have 150 disks full of all types of programs
All disks are £2.95. each

NOW FOR THE+4
From £3.75 per Disk.
Send SAE or phone for free catalogue (state model)

Kingsway Computers Services
72 Glencoe Road,
Sheffield S2 2SR
Tel:
0742 750623 / 0742 780222

HOME WORKERS WANTED
.(Mailing Enverlopes) £3 per Hr.
STAMPED S.A.E. TO
MAT KIZA
27 WOODSIDE PLACE
GLASGOW G37QL.

REPAIRS

C64, C+4.............................£30. inc.
C128. 1541..........................£40. inc.
Three month warranty, 1 week turnrounnd

SPARES

906114....	£9.30	8501.......	£11.75
6510.......	£11.50	C64 Power Pack	£22.00
6526.......	£11.95	C64 Cassette unit	£22.00
6581.......	£14.95		
6569.......	£21.50		

OASIS COMPUTER SERVICES
Dept 4C. 14 Ridgeway Road,
Salisbury, Wiltshire, SP1 3BU
Tel:(0722) 335061

COMMODORE 64/128 SOFTWARE LIBRARY

☆Life Membership
☆Updates
☆Teenage Mutant Hero Turtle Tape £1.75

☆ 7. Day Hire
☆Tapes From £1.50 to £1.75
Also Disks.

FOR FREE CATALOGUE S.A.E TO -
ACE SOFTWARE LIBRARY,
14 CHIPENDALE COURT, BELFAST, BT10 0DU

CLASSIFIED COUPON

ALL CLASSIFIED ADVERTISEMENTS MUST BE PRE-PAID.
THERE ARE NO REIMBURSEMENTS FOR CANCELLATIONS.

CDU CLASSIFIED DEPARTMENT, ALPHAVITE PUBLICATIONS,
20 POTTERS LANE, KILN FARM, MILTON KEYNES, MK11 3HF.

RATES:Lineage 58p per word (+VAT). Semi-display: £11.50 (+VAT) per single column cm minimum size 2cm. Series discounts available.

I enclose my Cheque/Postal Order for £..................for........................insertions, made payable to Alphavite Publications.
(Delete as necessary)

□□□□□□□□□□□□□□□□ PLEASE DEBIT MY ACCESS/VISA

CARD NO.:

EXP. DATE:..

£..................................FOR...........................INSERTIONS

Name:..

Address:..

....Post Code:..........................

Daytime Tel No.: ....

Signature: ....Date:..................................

❑ FOR SALE ❑ SOFTWARE ❑ SPECIAL OFFERS ❑ OTHER

ONLY POOLS AND HORSES

Every program written by a mathematician who has spent many years in the betting industry. Programs that utilise the tried and trusted methods of the professional, not pie in the sky theories that fail to pass the test of time.

FOOTBALL BOXFORM Written by a former pools expert for Littlewoods. The program has forecast over 50% more draws than would be expected by chance.
Homes, Aways and draws shown in order of merit and true odds given for every match. Merit tables show at a glance the teams currently in form and those currently having a lean spell.
Australian pools program included in the price.

SUPER PLANNER By the same author. Full details given of OVER 400 ENTRIES covering up to 57 selections. Includes SINGLE & MULTIPLE entries of LIT PLANS 1, 2, 9, 25, 27, 28, 29, 47, 48, 49, 50, 79, 80, 81, 82, 83, 84, 96, 100, 200, B37, B38, B39, B49, B50, B543, B58, B59, B145, B180, V-PLANS 20, 42, 43, 44, 83, 85, 87, TIP TOP 10 & 15, EXPRESS 35 & 38, MAIL 60, 75, E, P, MIRROR 1 & 8, FULL PERMS from 9 to 8 from 14. All are FULLY CHECKED in seconds by your computer. Not just the highest scoring but ALL POSSIBLE WINNING LINES.

POOLS PLANNER Similar to the above but covering block permutations using Littlewoods standard guarantee blocks.

RACING BOXFORM Course characteristics (built in to the program) as well as the form of the horses are considered to speedily produce an order of merit for each race. Designed for flexibility allowing users to amend the program if they wish. **Price** still includes the highly acclaimed HANDI CAP WINNER - more than 1000 winners every year - over 25% of them at 5/1 or better.

PUNTERS PARTNER Works out almost any bet. . doubles, trebles and accumulators including mixed stakes, yankee, canadian, heinz, goliath, patent, union jack, rounabouts, round the clock. Win or each way. Covers non runners, rule 4, dead heats. Versatile multiple odds calculator for fixed odds bets and the lines required for any full perm you're likely to meet.

PRICES (Tape) £16.95 each. £25.95 any two. £34.95 any three.
For discs please add £2. per program.

SPECIAL OFFERS FOOTBALL BOXFORM, RACING BOXFORM & PUNTERS PARTNER ... £27.95 TAPE, £31.95 DISC

FOOTBALL TOOL KIT Football Boxform, Super Planner, Pools Planner, Punters Partner ... £30 TAPE, £38 DISC

RACING TOOL KIT Racing Boxform, Punters Partner plus 4 further programs which enable you to keep your own records or produce and amend form and time ratings ... £33 TAPE, £38 DISC

BOTH THE ABOVE KITS ... £55 TAPE, £62 DISC

Advertised for Six years in the sporting and computing press.
BOXoft CLEVER.. GET THE BEST
Please make cheques or Postal orders payable to

BOXOFT (CDU), 65 Allans Meadow,
Neston, South Wirral L64 9SQ
Tel: 051 336 2668

VISA

BBC B & MASTER, AMSTRAD CPC & PCW COMMODORE 64/128, SPECTRUMS.

Complete Commodore 64 System

Hardware:

Commodore 64 (Mk1) computer, 1541 (Mk2) Disk Drive, MPS803 Printer, 1351 Mouse C2N Cassette Drive, CBM Comunications Modem, Final Cartrige 3, Datel Midi Interface Sonus Midi Interface, Datel Sample System

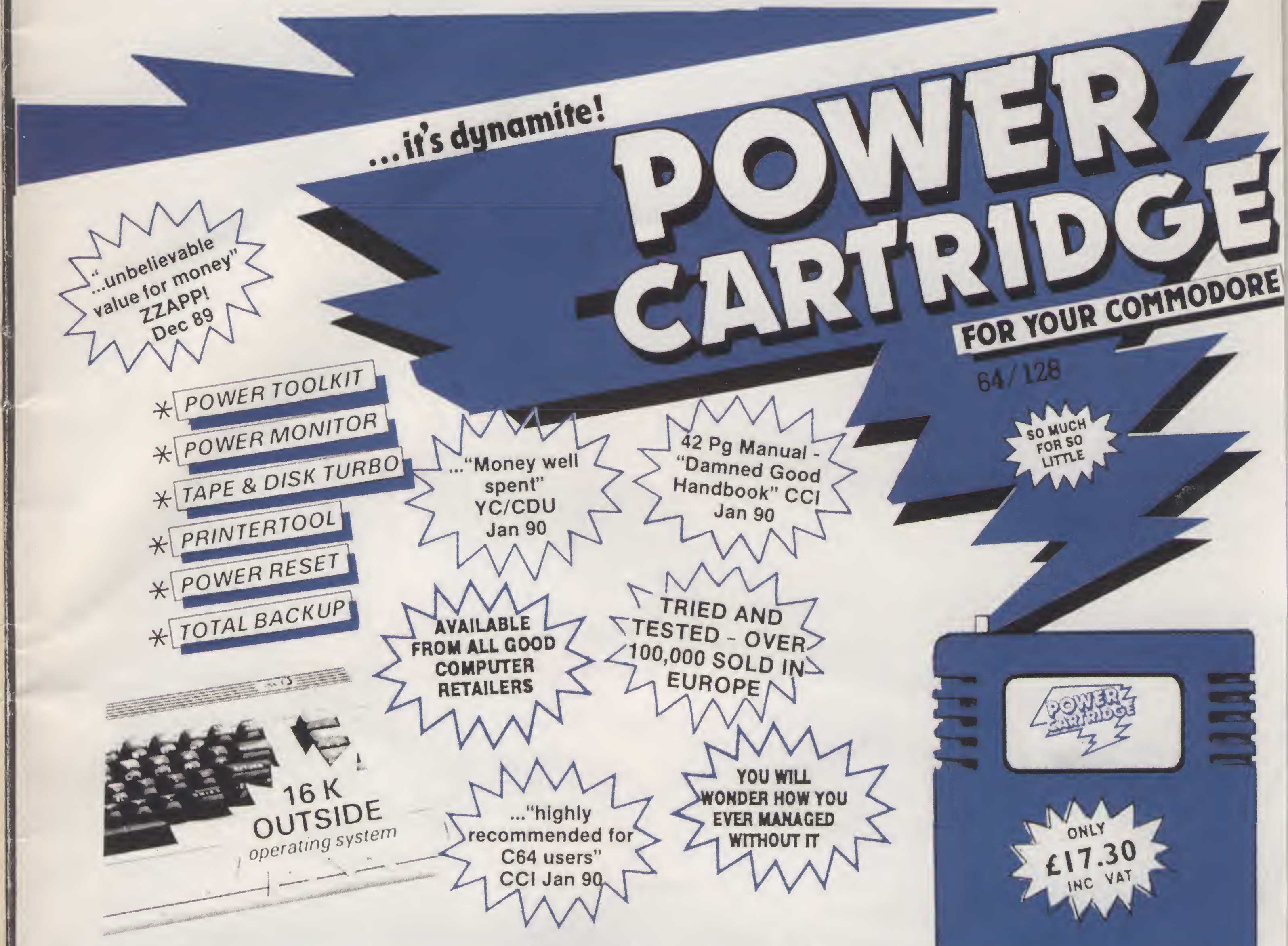
Software:

Sonus "Glasstracks" Midi Sequencer (one disk), Sonus "Midi Tech" Midi data analyser/librarian (on e disk)., Oxford Pascal Compiler, Sound Studio.

BOOKS:

C64 Advanced user guide, C64 Programmers reference guide, 6502 Assembler routines, Anatomy of the 1541 disk drive, Pascal from Basic.

£300 the lot.
Contact 0536-726845


...it's dynamite!
POWER CARTRIDGE
FOR YOUR COMMODORE
64/128
"...unbelievable value for money" ZZAPP! Dec 89
* POWER TOOLKIT
* POWER MONITOR
* TAPE & DISK TURBO
* PRINTERTOOL
* POWER RESET
* TOTAL BACKUP
..."Money well spent" YC/CDU Jan 90
42 Pg Manual - "Damned Good Handbook" CCI Jan 90
SO MUCH FOR SO LITTLE
AVAILABLE FROM ALL GOOD COMPUTER RETAILERS
TRIED AND TESTED - OVER 100,000 SOLD IN EUROPE
16 K OUTSIDE operating system
..."highly recommended for C64 users" CCI Jan 90
YOU WILL WONDER HOW YOU EVER MANAGED WITHOUT IT
POWER CARTRIDGE
ONLY £17.30 INC VAT

POWER TOOLKIT

A powerful BASIC-Toolkit (Additional helpful commands) that considerably simplifies programming and debugging.

AUTO
AUDIO
COLOR
DEEK
DELETE
DOKE
DUMP
FIND
HARDCAT
HARDCOPY
HEX$
INFO
KEY
PAUSE
PLIST
ILOAD
RENUMBER
REPEAT
SAFE
TRACE
UNNEW
QUIT
MONITOR
BLOAD

RENUMBER	: *Also modifies all the GOTO's GOSUB's etc Allows part of a program to be renumbered or displaced.*
PSET	: *Set up of printer type*
HARDCAT	: *Prints out Directory*

The toolkit commands can be used in your programs.

DISK TOOL

Using POWER CARTRIDGE you can load up to 6 times faster from disk.
The Disk commands can be used in your own programs.

DLOAD
DSAVE
DISK
DVERIFY
MERGE
DIR
DEVICE

MERGE	*Two BASIC programs can be merged into one.*
DISK	*With DISK you can send commands directly to your disk.*

TAPE TOOL

Using POWER CARTRIDGE you can work up to 10 times faster with your data recorder. The Tape commands can be used in your own programs.

LOAD
MERGE
SAVE
AUDIO
VERIFY

POWERMON

A powerful machine language monitor that is readily available and leaves all of your Commodore memory available for programming.
Also works in BASIC-ROM, KERNAL and I/O areas.

A	ASSEMBLE
C	COMPARE
D	DIS-ASSEMBLE
F	FILL
G	GO
H	HUNT
I	INTERPRET
J	JUMP
L	LOAD
M	MEMORY
P	PRINT
R	REGISTER
S	SAVE
T	TRANSFER
V	VERIFY
W	WALK
X	EXIT
$	DIRECTORY
	DOS Commands

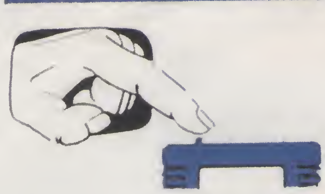
PRINTERTOOL

The POWER CARTRIDGE contains a very effective Printer-Interface, that self detects if a printer is connected to the Serial Bus or User-Port.
It will print all Commodore characters on Epson and compatible printers.
The printer-interface has a variety of set-up possibilities. It can produce HARDCOPY of screens not only on Serial printers (MPS801, 802, 803 etc) but also on Centronic printers (EPSON, STAR, CITIZEN, PANASONIC, etc).
The HARDCOPY function automatically distinguishes between HIRES and LORES. Multi-colour graphics are converted into shades of grey. The PSET functions allow you to decide on Large/Small and Normal/Inverse printing.
The printer PSET functions are:

PSET 0	- *Self detection Serial/Centronics*
PSET 1	- *EPSON mode only*
PSET 2	- *SMITH-CORONA mode only*
PSET 3	- *Turns the printing 90 degrees!!*
PSET 4	- *HARDCOPY setting for MPS802/1526.*
PSET B	- *Bit-image mode*
PSET C	- *Setting Lower/Upper case and sending Control Codes*
PSET T	- *All characters are printed in an unmodified state*
PSET U	- *Runs a Serial printer and leaves the User-port available*
PSET Sx	- *Sets the Secondary address for HARDCOPY with Serial Bus*
PSET L1	- *Adds a line-feed, CHR$ (10), after every line.*
PSET L0	- *Switches PSET L1 off*

Bitcon Devices Ltd does not authorise or purport to authorise the making by any means or for any purpose whatsoever of copies or adaptions of copyright works or other protected material, and users of the Power Cartridge must obtain the necessary prior consent for the making of such copies or adaptions from all copyright and other right owners concerned. See UK Copyright Designs & Patents Act 1988.

POWER RESET



On the back of the POWER CARTRIDGE there is a Reset Button. Pressing this button makes a SPECIAL MENU appear on the screen.
This function will work with many programmes.

CONTINUE	- *Allows you to return to your program*
BASIC	- *Return to BASIC*
RESET	- *Normal RESET*
TOTAL BACKUP DISK	- *Saves the contents of the memory onto a Disk. The program can be reloaded later with BLOAD followed by CONTINUE*
RESET ALL	- *RESET of any program*
TOTAL BACKUP TAPE	- *As BACKUP DISK but to TAPE*
HARDCOPY	*At any moment "prints out a Hardcopy of the screen. Using CONTINUE afterwards you can return to the program.*
MONITOR	*Takes you into the Machine language Monitor.*

BDL

Bitcon Devices Ltd

88 BEWICK ROAD
GATESHEAD
TYNE AND WEAR
NE8 1RS
ENGLAND

Tel: 091 490 1975 and 490 1919 Fax 091 490 1918
To order: Access/Visa welcome - Cheques or P/O payable to BDL
Price: £17.30 incl. VAT.
UK orders add £1.20 post/pack total - £18.50 incl. VAT.
Europe orders add £2.50. Overseas add £3.50
Scandinavian Mail Order and Trade enquiries to: Bhiab Elektronik, Box 216, Norrtalje 76123, SWEDEN. Tel: + 46 176 18425 Fax: 176 18401
TRADE AND EXPORT ENQUIRIES WELCOME

NEW

THE COMPLETE COLOUR SOLUTION

£179

Vidi ... No 1 in UK & Europe (Leading the way forward)

Get the most out of your Amiga by adding:

"The Complete Colour Solution"

The Worlds ultimate creative leisure product for your Amiga. Capture dynamic high resolution images into your Amiga in less than one second.

And Look No Filters

Images can now be grabbed from either colour video camera, home VCR or in fact any still video source. The traditional method of holding three colour filters in front of your video camera is certainly a thing of the past. Because Vidi splits the RGB colours electronically there are no focussing or movement problems experienced by some of our slower competitors. Lighting is also less of an issue as light is not being shut out by lens filters. Put all this together with an already proven Vidi-Amiga/VidiChrome combination and achieve what is probably the most consistant and accurate high quality 4096 colour images ever seen on the Amiga.

The colour solution is fully compatible with all Amiga's from a standard A500 to the ultimate A3000. No additional RAM is required to get up and running.

You will see from independant review comments that we are undoubtedly their first choice and that was before the complete solution was launched. If you have just purchased your Amiga and are not sure what to buy next, then just read the comments or send for full review and demo disk.

Actual unretouched digitised screenshot

Features ...

- Grab mono images from any video source
- Capture colour images from any still video source.
- Digitise up to 16 mono frames on a 1meg Amiga.
- Animate 16 shade images at different speeds.
- Create windows in both mono & colour.
- Cut & Paste areas from one frame to another.
- Hardware and software brightness & contrast control.
- Choice of capture resolutions standard & Dynamic interlace.
- Full Palette control.
- Add text or draw within art package.

Amiga Computing: The best Amiga digitiser has had the technicolour treatment. Vidi must be one of the most exciting peripherals you can buy for your Amiga.

Micro Mart: When I first saw Vidi "in the flesh" as it were, at the CES show last September it looked to be the answer to a frustrated Digi View owner's dreams – in fact to see pictures appearing on screen without the customary two minutes wait seemed almost too good to be true. I have consistently produced more good quality pictures in the short time I have had Vidi than I ever did with Digiview.

Zero: Now under normal circumstances cheap usually means poor quality but this is not the case with Rombo. Why? cos Vidi-Amiga is the best digitiser for under £500 and I've tried them all.

Amiga Format: Where quality is concerned, Vidi produces some of the best results I've seen on any digitiser at any price.

Amiga User International: The latest addition to the Rombokit is called Vidi-RGB and brings this already impressive package to the realms of totally amazing. CONCLUSION: Who will find Vidi-Amiga useful? The answer to this is almost anyone with a video recorder or camera and a passing interest in graphics.

Full colour demonstration disk available for only £1.95 to cover P&P.

ROMBO
Limited

6 Fairbairn Road, Livingston, EH54 6TS. Tel: 0506-414631 Fax: 0506-414634